Snow Glow® Inc

To: <snowglow@rangenet.com>
Sent: Thursday, November 22, 2001 10:06
Subject: Hazard Light Survey

Below is the result of your feedback form. It was submitted by
() on Thursday, November 22, 2001 at 21:06:10

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sex.and.age: Male 36-45

years.riding: 6 - 10 years

how.much.night.riding: 10% to 50%

firstname: Barry

lastname: Payne

ContactEmail: ridewhite_bc@yahoo.ca

street: 6646 Green Acres Way

city: Nanaimo

state: BC

zipcode: V9T5R9

Make.and.Model.Snowmobile: 93 ZR 700 Arctic Cat

Ever.Attend.Safety.Course?: no

Are.You.Concerned.When.Broke.Down.Because.Of.Possible.Collision?: no

Have.You.Purposely.Stopped.At.Night?: no

Do.You.Carry.Supplemental.Lighting: flashlight

If.You.Stop.What.Do.You.Do.To.Be.Seen?: no

Have.You.Ever.Been.Lost.Or.Broken.Down.At.Night?: no

Do.You.Know.Of.An.Injury.or.Collision.Because.Stopped.With?: no

Can.You.See.Benefit.Convenience?: no

One.To.Ten.Scale.Need?: 5, If you do alot of night riding it would be important, yet if you don't then it isn't.

comment: ebay

Other.SnowGlow®.Products.Questions?: no

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snowglow

To: <snowglow@rangenet.com>
Sent: Tuesday, November 20, 2001 9:19
Subject: Hazard Light Survey

Below is the result of your feedback form. It was submitted by
() on Tuesday, November 20, 2001 at 09:19:05

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sex.and.age: Female 36-45

years.riding: 11 - 15 years

how.much.night.riding: 10% to 50%

firstname: Debbie

lastname: Saam

ContactEmail: dsaam@bright.net

street: 17900 Dunbridge Rd.

city: Bowling Green

state: OH

zipcode: 43402

Make.and.Model.Snowmobile: 98 Skidoo Formula Z

Ever.Attend.Safety.Course?: No

Are.You.Concerned.When.Broke.Down.Because.Of.Possible.Collision?: Yes, but we always try to get as far off the trail as possible and to never stop on a curve or hill.

Have.You.Purposely.Stopped.At.Night?: Yes, but same as above.

Do.You.Carry.Supplemental.Lighting: No, didn't know it existed.

If.You.Stop.What.Do.You.Do.To.Be.Seen?: I usually ride last and so I will stay on my sled with the engine running and the brakes on so brake lights are lit.

Have.You.Ever.Been.Lost.Or.Broken.Down.At.Night?: We usually carry a flashlight but still it is a scary feeling.

Do.You.Know.Of.An.Injury.or.Collision.Because.Stopped.With?: No

Can.You.See.Benefit.Convenience?: Absolutely!

One.To.Ten.Scale.Need?: I think it is a great idea. It could save many lives and I don't see what the big deal would be to have them on every sled. Perhaps I just don't know how difficult and expensive an addition this would be. However, it seems just one more way to make the sport safer thus protecting it's continuation.

comment: Web site. Anything to make snowmobiling safer can only help towards the the continuation of this sport. I dread hearing about accidents and can't tell you how many people are out there that seem oblivious of the danger of stopping on the trail, sometimes right smack in the middle. People like that are a danger to the sport we all love so much. If there was some kind of factory installed safety lighting on these sleds it couldn't help but make things safer.

Snow Glow® Inc

To: <snowglow@rangenet.com>
Sent: Saturday, May 11, 2002 7:50
Subject: Hazard Light Survey

Below is the result of your feedback form. It was submitted by
() on Saturday, May 11, 2002 at 19:50:28

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sex.and.age: Male 36-45

years.riding: Over 21 years

how.much.night.riding: 10% to 50%

firstname: Jerry

lastname: Elford

ContactEmail: acrider1@aol.com

street: 6072 Hedgerow Cir.

city: Grand Blanc

state: Mi

zipcode: 48439

Make.and.Model.Snowmobile: Arctic Cat ZR600

Ever.Attend.Safety.Course?: Yes,I do not believe anything was said about that situation

Are.You.Concerned.When.Broke.Down.Because.Of.Possible.Collision?: Yes

Have.You.Purposely.Stopped.At.Night?: Yes

Do.You.Carry.Supplemental.Lighting: Yes, a small Mag-lite flashlight

If.You.Stop.What.Do.You.Do.To.Be.Seen?: Yes, but when away from my machine, there is no way to luminate it unless I left it running and then so much for quiet time

Have.You.Ever.Been.Lost.Or.Broken.Down.At.Night?: Used another machine's lights and/or somebody had a lighter

Do.You.Know.Of.An.Injury.or.Collision.Because.Stopped.With?: Luckily, I do not

Can.You.See.Benefit.Convenience?: Yes I do

One.To.Ten.Scale.Need?: 8.5 to 9. There are a lot of non-intelligent and inexperienced people out there who do not think about carrying a light. Those same people are the ones who don't know where to pull off on the trail. I feel any device that makes you more visible is worth it. People will be more likely to use something if it's convenient, and having it on the machine would be best.

comment: Just browsing for add on lights for my snowmobile

Other.SnowGlow®.Products.Questions?: If you have a catalog, please send one to the above address.
Thank you

Comment Snowmobile Light Petition

Stevenson, Todd A.

From: Swantec@aol.com
Sent: Monday, June 24, 2002 1:10 PM
To: cpsc-os@cpsc.gov
Subject: *Petition CP 02-2, Petition for Performance Standards for Auxiliary Hazard Lighti*

Petition CP 02-2, Petition for Performance Standards for Auxiliary Hazard Lighting Systems for Snowmobiles.

FOUL FOUL FOUL !!!!!

I feel that this request is self-serving only to Snow Glow. They have cleverly disguised the need as a safety concern when in actuality it would only boost their sales and put undue burden on the public along with the Snowmobile manufacturers.

I am a Snowmobile Safety Training Instructor registered in the state of Minnesota. I fully support efforts to improve the safety of our sport, however, I don't feel emergency hazard lighting would reduce or eliminate the risk of collision. In fact lights may increase the risk if someone felt they could leave their machine in harms way because "I had my flashers on". Furthermore the fact that Groomers (which have forward facing floodlights, rearward facing floodlights and rotating warning beacons) are collided with, says to me that a couple flashing lights on a snowmobile would not be of much help.

In teaching safety we stress the need for removing a disabled snowmobile from the "trail" immediately. Either get off the trail before you stop or move the machine from the trail manually. We also stress the "Buddy System" (never ride alone), which allows for help in these types of situations such as towing the disabled machine home.

The characteristics of Snow Glows system are quite satisfying in theory, however in reality they will be expensive to develop, implement and maintain and will only add a great deal of cost to the purchase price of snowmobiles.

First of all most snowmobiles don't come equipped with a separate energy source from the main power source. A source would have to be developed. One that would operate for a minimum of 40 hours at 0 degrees Fahrenheit, in my opinion, is over stretching the need by a great deal.

Second- a separate on-off switch is necessary however if one was thrown from their machine and rendered immobile, the system would be useless anyway.

And Third- ½ mile visibility, in most cases, would describe a need while on a lake where there usually are many more obstacles to look out for anyway. Should we put these systems on fish houses too?

Snowmobiles already have a mandatory headlight, taillight and reflectors for operation and visibility. More lights will not increase safety.

If Snow Glow and others want to manufacture and market these systems, let them be an optional accessory. But please don't make it mandatory equipment. The real strategy for increasing safety is Education, Alcohol Awareness and SLOW DOWN.

Thank You,
Jay Swanson
27709 112th Street
Zimmerman, Minnesota
763-856-4201

Stevenson, Todd A.

From: Leon074@aol.com
Sent: Tuesday, June 25, 2002 9:08 AM
To: cpsc-os@cpsc.gov
Cc: leon074@aol.com
Subject: Auxiliary Hazard Lighting Systems for Snowmobiles

Dear Commissioner,
I am writing to take a stand against the implementation of the hazard lighting systems. As a member of a snowmobile club, that struggles to make the trails safer with the small amount of money that we receive, I think that the lights are not valuable.

I believe that the money would be better spent on the trails, to widen them, provide better signage, and groom them more often.

If a snowmobiler is in trouble with a machine, they should be pulled off to the side of the trail and they will be able to see and hear the other riders that are approaching them. Experienced night time drivers will have flashlights for warning aproaching machines.

Another opinion... don't make decisions about this topic unless you have ridden 1000 miles and a couple of seasons. You can not make good decisions from a distance on a topic like this.

International Snowmobile Manufacturers Association
1640 Haslett Rd., Suite 170 • Haslett • Michigan 48840 • (517)339-7788 • Fax: (517)339-7798
Web: www.snowmobile.org

July 1, 2002

Via Hand Delivery

Consumer Product Safety Commission
Office of the Secretary, Room 501
4330 East-West Highway,
Bethesda, Maryland 20814

Re: Petition CP 02-2, Petition for Performance Standards for Auxiliary Hazard Lighting Systems for Snowmobiles

To the Consumer Product Safety Commission:

Please find attached the comments of the International Snowmobile Manufacturers Association ("ISMA") regarding Petition CP 02-2, Petition for Performance Standards for Auxiliary Hazard Lighting Systems for Snowmobiles. 67 Fed. Reg. 21222 (April 30, 2002).

The International Snowmobile Manufacturers Association appreciates the opportunity to comment on the U.S. Consumer Product Safety Commission's ("CPSC") Federal Register notice regarding the petition requesting standards for auxiliary hazard lighting systems for snowmobiles. ISMA represents the four major snowmobile manufacturers, Arctic Cat, Bombardier (also known as Ski-Doo), Polaris and Yamaha, which together account for approximately 99 percent of all domestic snowmobile sales.

If you have any questions regarding the attached comments, or desire additional information, please do not hesitate to contact ISMA.

Sincerely,

Ed Klim /gm
for Ed Klim
President, ISMA

Attachment

BEFORE THE
UNITED STATES CONSUMER PRODUCT SAFETY COMMISSION

COMMENTS BY THE INTERNATIONAL SNOWMOBILE MANUFACTURERS ASSOCIATION REGARDING NOTICE OF PROPOSED RULEMAKING

Petition for Performance Standards for Auxiliary Hazard Lighting Systems for Snowmobiles.	**Petition CP 02-2**
67 Fed. Reg. 21222 (April 30, 2002)	

International Snowmobile Manufacturers Association
1640 Haslett Road, Suite 170
Haslett, MI 48840

July 1, 2002

TABLE OF CONTENTS

I. Introduction

The International Snowmobile Manufacturers Association ("ISMA") appreciates the opportunity to comment on the U.S. Consumer Product Safety Commission's ("CPSC") Federal Register notice regarding a Petition Requesting Performance Standards for Auxiliary Hazard Lighting Systems for Snowmobiles. 67 Fed. Reg. 21222 (April 30, 2002). ISMA represents the four major snowmobile manufacturers, Arctic Cat, Bombardier (also known as Ski-Doo), Polaris and Yamaha, which together account for approximately 99 percent of all domestic snowmobile sales.

ISMA and its members have always supported continued efforts to improve the snowmobile experience for our customers. This includes supporting education programs to improve rider safety and development of new snowmobile technologies that enhance rider safety and reduce the likelihood of accidents or injuries. ISMA, its member companies, and the numerous snowmobile organizations across the nation have a long history of working to improve snowmobile safety.

ISMA and its member companies have reviewed the materials submitted to CPSC by Snow Glow (hereinafter referred to as the "Petition") and conclude that there is no basis for establishing a mandatory standard dictating the use of the Snow Glow product on snowmobiles. The information provided in the Snow Glow Petition simply does not provide any technical basis for concluding (1) that snowmobiles equipped without the Snow Glow device present an unreasonable risk of injury, nor (2) that there is a need for a mandatory rule to address current snowmobile designs, nor (3) that snowmobiles present an unreasonable risk of injury in the absence of the Snow Glow product. However, under the CPSC's regulations, the Snow Glow petition is required to make these demonstrations in order to have the Commission grant the Petitioner's request. *See* 16 CFR §1051.9

II. Discussion

A. Background on the Snowmobile Industry's Commitment on Safety

As noted above, ISMA members Arctic Cat, Bombardier, Polaris and Yamaha account for approximately 99 percent of all domestic snowmobile sales. In order to ensure that the snowmobiles produced by ISMA members provide our customers with a safe and enjoyable riding experience ISMA actively participates in snowmobile safety efforts. The industry has a strong tradition of supporting rider groups, rider education programs, and rider self-regulation efforts.

Snowmobile manufacturers have been actively involved in promoting safe riding behavior while snowmobiling. Over one million brochures, decals and hundreds of thousands of posters and safety videos have been distributed free of charge to snowmobile enthusiasts throughout the world. Safety trainers, enforcement officers, Chambers of Commerce and others use safety materials provided by the manufacturers through the **Safe Riders! You Make Snowmobiling Safe™** safety campaign. ISMA, supported by the industry, promotes safe snowmobiling through the **Safe Riders! You Make Snowmobiling Safe** campaign. The international effort outlines safety guidelines that must be observed while snowmobiling. Free

information available for use and distribution in promoting safety and assisting in safety education classes include:

- 22 minute safety video titled **"Safe Riders, You Make Snowmobiling Safe"** - This video features key safety issues and areas of rider responsibility explained and presented in a clear fashion. A copy of ISMA's "Facts on Snow" and "Safe Riders! You Make Snowmobiling Safe" video is included with these comments (Attachment A).
- **Safe Riders! Safety Brochures** - Discusses key areas of snowmobiling safety.
- Safety Decals
- **Safe Riders! Posters** - These include a variety of posters such as a logo poster and position posters discussing key issues of the safety campaign (*i.e.* alcohol and riding don't mix, always check local ice conditions).
- **Video Public Service Announcements** - Four TV production quality public service announcement videos covering key safety issues within the snowmobile community.
- Radio Public Service Announcements - are broadcast ready.

A comprehensive snowmobile machine safety standards program is sponsored by the Snowmobile Safety and Certification Committee (SSCC), a non-profit organization interested in safe snowmobiling. In 1981, the SSCC received the U.S. National Safety Council's "Distinguished Service to Safety" award for its effective work in improving the safety of snowmobiling.

Under the SSCC machine safety standards program, snowmobiles are certified by an independent testing company as being in compliance with all SSCC safety standards. The SSCC independent certification program covers every vital component of the snowmobile; electrical, lighting and brake systems; emergency control; brake and throttle controls; fuel system; reflectors; handgrips; seat; shields and guards. The SSCC standard also sets maximum permissible sound levels of no more than 78 dB(A) + 2 dB(A) at 50 feet when the snowmobile is traveling at full throttle and no more than 73 dB(A) + 2 dB(A) at 50 feet when the snowmobile is traveling at 15 mph.

The SSCC standard exceeds state government standards in all snowbelt states. Under Transport Canada regulations, all new snowmobiles sold in Canada since 1987 are required to meet the current SSCC standards. The compliance of a snowmobile with the SSCC standard is indicated by the SSCC's black and white certification label, which is generally placed on the right rear tunnel of the machine. These labels are distributed to the manufacturers only after an independent testing laboratory determines that the model is in compliance with the SSCC standard.

Improvement of trail and riding areas is another major area in which improvements have been made. Increased trail riding opportunities and improvements in trails have resulted in more snowmobiles operating on well-maintained organized snowmobile trails. Trail design, marking, grooming, and maintenance (including removal of hazards) has a marked effect on the occurrence of accidents. The Canadian Council of Snowmobile Organizations (CCSO) reports that over the past 5 years in Canada less than 20 percent of the snowmobile fatalities have occurred on recognized snowmobile trails with the remaining 80 percent being off-trail. This disparity occurred when an estimated 80 percent of the total number of kilometers ridden each

year by snowmobilers occurred on maintained club trails versus about 20 percent off-trail riding.[1] Very clearly from a safety perspective this activity has a major impact on the frequency of accidents because improved snowmobile trails provide a safer riding environment.

The combination of rider education programs, SSCC machine safety standards, and trail infrastructure improvements has served the industry well. Through continued rider education, advancements in snowmobile technology, and improvements in the riding environment, snowmobile riders will be able to better enjoy the outdoors experience that snowmobiles offer.

B. Regulatory Requirements Applicable to the Snow Glow Petition

1. Necessity Requirement

The Snow Glow Petition requests CPSC to promulgate a mandatory standard that requires all new snowmobiles be equipped with a lighting system that is essentially identical to the Snow Glow product. The Federal Register notice states that the Snow Glow submittal is to be treated as a petition for rulemaking under the Commission's regulations. 67 Fed. Reg. 21222 (April 30, 2002). The provisions of 16 CFR Part 1051 govern petitions for rulemaking. Specifically, the factors that the Commission must weigh in granting or denying a petition are listed in 16 CFR §1051.9(a).

> Factors the Commission considers in granting or denying petitions. (a) The major factors the Commission considers in deciding whether to grant or deny a petition regarding a product include the following items: (1) Whether the product involved presents an unreasonable risk of injury. (2) Whether a rule is reasonably necessary to eliminate or reduce the risk of injury. (3) Whether failure of the Commission to initiate the rulemaking proceeding requested would unreasonably expose the petitioner or other consumers to the risk of injury which the petitioner alleges is presented by the product. (4) Whether, in the case of a petition to declare a consumer product a ``banned hazardous product'' under section 8 of the CPSA, the product is being or will be distributed in commerce and whether a feasible consumer product safety standard would adequately protect the public from the unreasonable risk of injury associated with such product.

16 CFR §1051.9(a).

Based on the regulatory criteria for evaluating petitions, the Snow Glow Petition must demonstrate that the current snowmobiles produced (1) present "an unreasonable risk of injury" if they are not equipped with a Snow Glow device, (2) that a mandatory "rule is reasonably necessary to eliminate or reduce the risk," and (3) that denial of the petition would "unreasonably

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[1] See the Canadian Council of Snowmobile Organizations website on trail infrastructure at: http://www.ccso-ccom.ca/infra.htm.

expose the petitioner or other consumers to the risk of injury" which Snow Glow alleges is presented by current snowmobiles.

2. Priority Demonstration

Even if such a demonstration were possible, an additional important factor that must be considered is the relative priority of the risk of injury. Under the regulations the Commission must consider whether the safety risk alleged in a petition justifies devoting the CPSC's resources in a rulemaking.

> In considering these factors, the Commission will treat as an important component of each one the relative priority of the risk of injury associated with the product about which the petition has been filed and the Commission's resources available for rulemaking activities with respect to that risk of injury. The CPSC Policy on Establishing Priorities for Commission Action, 16 CFR 1009.8, sets forth the criteria upon which Commission priorities are based.

16 CFR §1051.9(b).

The Commission has established a priority policy that places emphasis on the frequency and severity of the injuries, and the amenability of an alleged product hazard to risk reduction through standard setting, information and education. Other factors include the vulnerability of the population at risk (*e.g.* elderly or children), the unforeseen nature of the risk, the costs and benefits associated with such measures, the potential for future injuries or chronic effects, and the probability of exposure to the risk. The specific factors are described in 16 CFR §1009.8(c)[2].

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[2] 16 CFR §1009.8 ("In establishing and revising its priorities, the Commission will endeavor to fulfill each of its purposes as set forth in section 2(b) of the Consumer Product Safety Act. In so doing, it will apply the following general criteria: (1) Frequency and severity of injuries. Two major criteria in determining priorities are the frequency and severity of injuries associated with consumer products. All available data including the NEISS hazard index and supplementary data collection systems, such as fire surveys and death certificate collection, shall be used to attempt to identify the frequency and severity of injuries. Consideration shall also be given to areas known to be undercounted by NEISS and a judgment reached as to the probable frequency and severity of injuries in such areas. The judgment as to severity shall include an evaluation of the seriousness of the injury. (2) Causality of injuries. Consideration shall then be given to the amenability of a product hazard to injury reduction through standard setting, information and education, or other Commission action. This step involves an analysis of the extent to which the product and other factors such as consumer behavior are causally related to the injury pattern. Priority shall be assigned to products according to the extent of product causality involvement and the extent of injuries that can reasonably be expected to be reduced or eliminated through commission action. (3) Chronic illness and future injuries. Certain products, although not presently associated with large numbers of frequent or severe injuries, deserve priority attention if there is reason to believe that the products will in the future be associated with many such injuries. Although not as susceptible to measurements as other product related injuries and illnesses, these risks shall be evaluated on the basis of the best information available and given priority on the basis of the predicted future illnesses and injuries and the effectiveness of Commission action in reducing or eliminating them. (4) Cost and benefit of CPSC action. Consideration shall be given on a preliminary basis to the prospective cost of Commission action to consumers and producers, and to the benefits expected to accrue to society from the resulting reduction of injuries. Consideration of product cost increases will be supplemented to the extent feasible and necessary by assessments of effects on utility or convenience of the product; product sales and shifts to substitutes;

In order to justify a rulemaking to require the Snow Glow device Petitioner would need to demonstrate that the hazard resulting from snowmobile operation without the Snow Glow device results in frequent and severe injuries and that these injuries would be prevented by the Snow Glow device. In addition, to the extent that the Snow Glow device would not protect a vulnerable population, would not address an unforeseen risk, have no effect on chronic injuries, and there existed no reason to believe the number of injuries will grow in the future, these factors would also be relevant in determining the priority of the proposed rulemaking under the CPSC's regulations.

C. Technical Evaluation of the Snow Glow Device

1. Lack of Compelling Safety Need

As an initial matter, the Snow Glow Petition does not address the basic question of whether there is a safety risk associated with snowmobiles that necessitates promulgation of a mandatory standard requiring the Snow Glow hazard lighting system. The Petition contains a great deal of anecdotal information. Nowhere in the forwarding letter from Snow Glow is there

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and industry supply factors, competitive structure, or employment. While all these facets of potential social ``cost'' cannot be subsumed in a single, quantitative cost measure, they will be weighed, to the extent they are available, against injury reduction benefits. The benefit estimates will be based on (i) explicitly stated expectations as to the effectiveness of regulatory options (derived from criterion (2), ``causality of injuries''); (ii) costs of injuries and deaths based on the latest injury cost data and analyses available to the Commission; (iii) explicit estimates or assumptions as to average product lives; and (iv) such other factors as may be relevant in particular cases. The Commission recognizes that in analyzing benefits as well as costs there will frequently be modifying factors--e.g., criteria (5) and (6)--or analytical uncertainties that complicate matters and militate against reliance on single numerical expressions. Hence the Commission cannot commit itself to priorities based solely on the preliminary cost/benefit comparisons that will be available at the stage of priority setting, nor to any one form of comparison such as net benefits or cost-benefit ratios. Commission costs will also be considered. The Commission has a responsibility to insure that its resources are utilized efficiently. Assuming other factors to be equal, a higher priority will be assigned to those products which can be addressed using fewer Commission resources. (5) Unforeseen nature of the risk. Other things being equal, consideration should be to the degree of consumer awareness both of the hazard and of its consequences. Priority could then be given to unforeseen and unforeseeable risks arising from the ordinary use of a product. (6) Vulnerability of the population at risk. Children, the elderly, and the handicapped are often less able to judge or escape certain dangers in a consumer product or in the home environment. Because these consumers are, therefore, more vulnerable to danger in products designed for their special use or frequently used by them, the Commission will usually place a higher priority, assuming other factors are equal, on preventing product related injury to children, the handicapped, and senior citizens. (7) Probability of exposure to hazard. The Commission may also consider several other things which can help to determine the likelihood that a consumer would be injured by a product thought to be hazardous. These are the number of units of the product that are being used by consumers, the frequency with which such use occurs, and the likelihood that in the course of typical use the consumer would be exposed to the identified risk of injury. (8) Additional criteria. Additional criteria may arise that the staff believes warrant the Commission's attention. The Commission encourages the inclusion of such criteria for its consideration in establishing priorities. The Commission recognizes that incontrovertible data related to the criteria identified in this policy statement may be difficult to locate or develop on a timely basis. Therefore, the Commission may not require extensive documentation on each and every criterion before making a decision. In addition, the Commission emphasizes that the order of listing of the criteria in this policy is not intended to indicate either the order in which they are to be considered or their relative importance. The Commission will consider all the criteria to the extent feasible in each case, and as interactively or jointly as possible.").

reference to any statistics supporting Petitioner's contention that hazard warning lights are necessary based on the frequency of snowmobile collisions at night. Thus, based on the Petitioner's materials it is not possible to determine if there is any quantifiable safety risk associated with snowmobile operation without a Snow Glow lighting system.

The sole "data" in the Snow Glow Petition regarding the safety risk at issue includes (a) letters from the petitioner restating their claims that the warning light system is necessary, articles on the claims, (b) news articles discussing snowmobile accidents in general, (c) other short letters from a few individuals that encourage Snow Glow's development of their product, (d) "survey" forms completed by individuals who have visited the Snow Glow website, (e) five excerpted pages of reported snowmobile incidents from the CPSC's National Injury Information Clearinghouse, and product installation instructions. None of this information provides a statistical basis for assessing the risk of collisions at night resulting from a stopped snowmobile with no lights.

As noted above, the Snow Glow letter dated January 30, 2002 contains a total absence of data supporting the Petitioner's claim of a significant safety risk. The letter from the Petitioner (Petition at pp. 4-6) contains no statistics to support the claims that nighttime collisions between an operating snowmobile and a stopped snowmobile, due to lack of lighting, is a significant safety issue. Rather, the letter merely summarizes and repeats the opinions of the petitioner that their product should be required on all snowmobiles.

Likewise, the news articles contained in the petition provide no support for concluding that there is a statistically significant risk of collisions at night with a stopped snowmobile with no lights. The Minnesota Sportsman article (Petition at pp. 20-23) contains no statistics relevant to the Snow Glow product. In fact, the article emphasizes the major role of many factors, including speed, impaired driving, driver inattention, unfamiliar terrain, and open water/ice operation, lack of supervision (youth riders), and finally night riding. With respect to night riding the article mentions the tendency to overdrive the range of the headlights and icing of the face shields at night. The article also mentions the obvious fact that many objects (example: utility guy wires) are not visible at night. The article points out that excessive speed and alcohol are the "deadly combination" involved in most accidents and concludes "the majority of snowmobile accidents can be prevented . . . . if your sled's in good shape and you ride responsibly, your chances of an accident are small." The article summarizes the situation by noting that in fact most accidents are preventable and quoting Victor Wood, the snowmobile program administrator with the New York Parks, Recreation, and Historic Preservation Division who states that "in a nutshell it comes down to common sense."

The two additional articles contained in the petition also do not add data that can be used to determine the significance of any safety concern. The December 9, 2001 News Tribune article (Petition at pp. 99-101) recounts the efforts of Snow Glow to promote their product but does not add data that supports a finding of significant risk. The Second News Tribune article (Petition at p. 102, no date provided) cites state Department of Natural Resources (DNR) statistics from Wisconsin and Minnesota that allegedly support the need for the Snow Glow product. Careful review of the cited statistics in fact supports the opposite conclusion, that there is little safety risk and few injuries and fatalities that result from collisions with a stopped snowmobile due to limited visibility.

The Wisconsin statistics are collected in an annual Wisconsin DNR report. The report is attached as Attachment B and is available at http://www.dnr.state.wi.us/org/es/enforcement/safety/pdfs/SnowmobileFatalReport.pdf. The accident summaries in the report reveal that of the 26 fatalities in Wisconsin during the 2000-2001 season, none involved a snowmobile striking another snowmobile that had been shutdown at night. The 17 fatalities cited by the article that occurred during dusk or darkness involved collisions with an operator thrown from a preceding snowmobile (cases 2, 4, 5), a collision between two snowmobiles operating on a private trail that approached the crest of a hill from opposite sides (cases 11 and 12), a collision with a tree after failing to negotiate a turn (cases 8, 17, 20, 24), collision with a tree after leaving a trail (case 9, 10), collision head-on with another snowmobile operating on private property (case 14), striking a three strand fence (case 15), rider ejection after leaving the trail and riding into a ditch (case 18), and drowning after falling through the ice (cases 1, 25 and 26). In none of these cases would a Snow Glow product have been relevant. The incidents either involved operator ejection, striking a stationary object (tree or fence), failure to negotiate the terrain, or direct collisions between snowmobiles approaching each other.

The Wisconsin fatality data presents clear evidence that the major factors involved in snowmobile accidents were excessive speed and alcohol. "The leading contributing factors were excessive speed and alcohol consumption." Attachment B at p. 3 (emphasis in original). Alcohol contributed to 46 percent of the fatalities where a toxicology report was available. In 11 of the 26 fatal crashes (42 percent) "investigators could directly identify excessive speed as a contributing factor." *Id.* While striking a stopped snowmobile at night is certainly a possibility, the Wisconsin statistics demonstrate that the situation posited by the Petitioner did not result in any fatalities in Wisconsin during the most recent year for which statistics are available. Further, it is clear that other factors such as alcohol use and excessive speed pose the greatest risk and result in many preventable fatalities.

The Minnesota statistics referred to in the December 9, 2001 News Tribune article are also cited by Snow Glow as evidence that a significant risk exists that must be addressed with mandatory hazard warning light regulations. Again, detailed examination of the actual accident summaries reveals that the fatalities resulted from the same factors cited above, excessive speed and alcohol. The Minnesota DNR report for the 2000-2001 season is attached (Attachment C). The accident summaries indicate that of the 28 snowmobile fatalities, 14 occurred during daylight hours. Of the 14 non-daylight fatalities, the accidents involved running into trees (12/14/00, 12/20/00, 3/17/01), passenger or operator ejection (12/29/00, 12/29/00, 3/4/01), colliding with a motor vehicle (12/20/00) colliding into another snowmobile while traveling together (12/30/00, 2/10/01), colliding head on (1/20/01, 1/27/01, 1/27/01), driving into a drainage ditch (2/10/01), and driving into a wire fence (3/12/01). In only two of the cases is it even possible that a Snow Glow device could have been at all relevant. These two incidents involved collisions between snowmobiles traveling together. Because there is insufficient detail in the Minnesota DNR summary, it is not possible to state whether such a device would have been relevant. It is important to note that in both of these cases the deceased had blood alcohol content (BAC) readings above 0.10 (the actual readings were 0.15 and 0.11). Again, as with the statistics from Wisconsin, the Minnesota statistics indicate that alcohol is a primary factor influencing the frequency of accidents. The Minnesota DNR report indicates that 77.8 percent of the operators involved in fatal accidents had positive alcohol readings. Attachment C at p. 1.

Petitioner also offers letters endorsing the use of the Snow Glow product (Petition at pp. 30-35). These letters offer no statistics or other quantitative data supporting the opinions offered in the letters. As such, the letters are little more than user testimonials, common to any product. The letters contain language typical of such letters: "I personally support" (Petition at p. 30), "I firmly believe" (Petition at p. 31), "the reasons are obvious" (Petition at p. 32). However, with no data to support their opinions, the letters provide no assistance in determining any actual safety contribution that could be made by the Snow Glow lighting system.

Additional "data" offered by the Petitioner are a selection of five pages from a printout of snowmobile incidents reported to the National Injury Information Clearinghouse from 1995 to October 2001. Petition at pp. 77-81. The selected pages are described as "random samples" out of a "four inch stack of reported accidents." Petition at p. 76. Unfortunately, the brief summaries are insufficient to determine the root cause of the incident, whether the incident occurred during daylight hours, whether excessive speed or alcohol was involved, and whether there were other important factors involved. For example, the one incident included in the five pages submitted by Petitioner that is also included in the DNR reports above, Incident No. 525, occurred during broad daylight. The operator in that accident also tested positive for blood alcohol. *See* Attachment C at p.3. The "data" as presented is simply a compilation of incidents involving snowmobile injuries. As such, it provides no support for Snow Glow's contention that snowmobile operation without the Snow Glow light system presents a significant safety risk as compared to the normal hazards typically associated with operating a snowmobile.

The Petitioner also presents 15 selected responses from their "survey" that was conducted on their website, http://www.snowglow.com/. The survey is located at: http://www.snowglow.com/Survey.htm (also attached as Attachment D). This survey in no way represents a random sample of active snowmobilers. The "survey" only queries those snowmobilers who are visitors to the Snow Glow site and who are therefore interested in aftermarket snowmobile lighting systems. The "survey" results are further distorted because the person filling out the survey is provided with the desired responses in a blatant manner. This signaling occurs on the very page that encourages the respondent to fill out the survey. The Snow Glow survey introduction states, "a built-in hazard light system could be a life saver, whose time has come. Tell us what you think. To help ensure that snowmobiling is around for years to come - for you, your children, and your grandchildren to enjoy, please complete the brief questionnaire below." *See* http://www.snowglow.com/Survey.htm.

The unrepresentative sample, the small numbers of respondents (only 135 listed on the website as of June 27, 2002) and unscientific sampling methodology make the results useless in determining the actual perceived need for the device among snowmobile operators. A much more objective assessment of the consumers' perceived value for a Snow Glow lighting system are the actual sales volumes when offered to the buying public. The actual sales volume of the Snow Glow system has been extremely limited. Details are provided in the section addressing consumer demand, below.

As demonstrated above, the major causes of snowmobile accidents are largely associated with operator behavior rather than snowmobile design. Two of the major causes of snowmobile accidents are alcohol and excessive speed. The results from the Minnesota and Wisconsin DNR reports are consistent with scientific studies that have examined the risk factors associated with

snowmobile operation. In a paper published in the Annals of Emergency Medicine researchers in Canada analyzed the risk factors associated with off-road vehicle accidents in Ontario.[3] This paper is attached (Attachment E). The researchers found that alcohol was implicated in 75 percent of operators involved in fatal snowmobile accidents. Attachment E at p. 845. This was a much higher rate than that found for motor vehicle or motorcycle fatalities. Further statistical examination of the data by the researchers indicated that an apparent correlation between fatalities and time of day (*i.e.* higher fatality rates at night) "disappears when adjustments are made for blood alcohol content." *Id.* Thus, the apparent increase in fatalities during nighttime operation is actually a result of the elevated use of alcohol by operators at night. No statistically significant association between nighttime riding and fatalities remained once the confounding influence of elevated blood alcohol content was accounted for. The researchers concluded "snowmobile drivers must be educated further about the strong association of snowmobile fatalities with alcohol use." Attachment E at p. 847.

Other researchers have investigated the risk factors associated with snowmobile operation. A review of snowmobile injuries in New Hampshire reported in the Center for Disease Control's Morbidity and Mortality Weekly Report found that 67 percent of the fatal accidents were associated with alcohol use and 67 percent were also associated with excessive speed. *See* Injuries Associated With Use of Snowmobiles – New Hampshire, 1989-1992, MMWR, January 13, 1995 at pp. 1-3 (included as Attachment F). Again, the findings reported by the CDC are consistent with the conclusions of other researchers that driver behavior is the key factor determining the accident rates.

Similarly, research conducted by the Traffic Injury Research Foundation of Canada and presented at the 13th International Conference on Alcohol, Drugs and Traffic Safety (T95") indicates that alcohol was involved in 79 percent of the fatal snowmobile accidents. This is a higher rate than found for on-highway fatalities.[4] This paper is attached as Attachment G.

The data on the risks associated with snowmobile accidents is clear. Accidents do occur, but they are largely preventable and they are the direct result of operator behavior. The vast majority of accidents that occur do not involve conditions under which a hazard lighting system would have any relevance. The statistics associated with snowmobile accidents are dominated by unfortunate incidents in which drivers are either impaired, are driving at excessive speeds, or are otherwise operating the vehicle is manner that is not consistent with proper snowmobile operation (example: driving over thin ice).

The Petitioner has failed to provide any statistical basis for its assertion that the Snow Glow device is needed to address a serious safety risk. The SAE Snowmobile Committee Chairman, Bruce Enderle in a memorandum dated May 30, 2002, also noted this lack of data. Mr. Enderle's memorandum is attached (Attachment H). Mr. Enderle has requested that Snow Glow provide the SAE Snowmobile Committee with data concerning the frequency of nighttime

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[3] B. Rowe et. al., The Association of Alcohol and Night Driving with Fatal Snowmobile Trauma, Annals of Emergency Medicine, November 1994, 24:842-848.

[4] DJ Beirness, DR Mayhew. and HM Simpson, "Alcohol Involvement in Snowmobile Fatalities in Canada", 13th International Conference on Alcohol, Drugs and Traffic Safety ("T95").

accidents that involved repeatable patterns that could be identified as hazards. Mr. Enderle also requested that Snow Glow review available accident reports to support Snow Glow's assertion that a supplemental lighting system should be mandated. Snow Glow has never provided any of the requested data to the SAE Snowmobile Committee nor reviewed the available accident reports cited above. Given the lack of data provided by Snow Glow it is understandable that the SAE Snowmobile Committee declined to adopt a standard requiring a Snow Glow system. The SAE Snowmobile Committee "found no statistical support for standards writing on this issue." *See* SAE Snowmobile Committee letter dated October 16, 2001 (Attachment I).

2. Ineffectiveness of Proposed Device

The Snow Glow Petition attempts to demonstrate the effectiveness of their device through a series of photographs. *See* Petition at pp. 2, 7-10. These photographs are used by Snow Glow as support for their contention that the hazard lighting system greatly increases the visibility of a parked snowmobile at night. The photographs were taken at night with various lighting conditions. These pictures are insufficient evidence upon which to base a conclusion regarding the relative visibility of the snowmobile with and without the Snow Glow lighting system.

Research into the nighttime visibility issues has confirmed that producing reliable nighttime conspicuity photographs is a major task. *See e.g.* "Visibility Study – Methodologies and Reconstruction." Klein, E. and G. Stephens. SAE Technical Paper No. 921575, 1992; and "Nighttime Photography – Show It Like It Is." Holohan, R.D., A.M. Billing and S.D. Murray. SAE Technical Paper No. 890730, 1989. These references are attached (Attachments J and K). The inability to judge nighttime conspicuity based on a photograph is due to the lack of an objective basis or calibration point in order to scientifically evaluate the content of night-time photographs, *e.g.*, contrast or a verbal description of what else is visible to the unaided eye. If this is not done, the photographs produced from such an "ad hoc" process are indicative of modern camera and film technology rather than of actual conspicuity/visibility properties. In addition, photographic prints (versus slides) are the result of a two-step process – the exposure of the negative film and the exposure of the print paper through the negative. The results of the photographic process may bear little or no relationship to the actual conspicuity characteristics of the photographed condition.

In order to assess the ability to discern the snowmobile equipped with a Snow Glow lighting system, several snowmobile manufacturers conducted evaluations of the device. These evaluations include written reports by the Snowmobile Safety and Certification Committee, Bombardier Arctic Cat which are attached (Attachments L, M, and N). In summary, these evaluations indicate that the Snow Glow lighting system has several limitations. The limitations include the following:

a. The installation of the Snow Glow system directly within the lenses of the headlamp and taillight affects the photometrics of these lights and could affect their illumination characteristics.

b. The installation of the Snow Glow device in the headlamp results in completely diminishing the light when the hood is raised. Raising the hood often occurs when troubleshooting a sled in the field.

c. The rear light does not indicate any blinking when the headlamp of either a car or snowmobile is approaching the rear of the snowmobile. This indicates that the reflective ability of the taillight serves the same purpose as the Snow Glow system with no discernable difference in visibility.

d. At close range the headlamp blinking is not bright, indicating that the Snow Glow system adds little to the visibility of the sled.

e. There is virtually no lateral view of the lights blinking when using the Snow Glow product. The Snow Glow product is only visible over a narrow range of angles.

f. Unlike some existing supplemental snowmobile lighting products, the Snow Glow device does not provide 360-degree visibility to approaching snowmobiles.

g. Unlike existing supplemental snowmobile lighting products, the Snow Glow device cannot be removed and placed high on the sled to improve visibility. The Snow Glow product cannot be hung from a nearby tree nor carried by the snowmobiler as they traverse a trail or road. This allows illumination of the entire sled or the area surrounding the sled.

The above testing and evaluation of Petitioner's device indicates that the Snow Glow system provides little improvement in visibility over the current reflective material used on snowmobiles. *See* ¶¶ II.C.2.c above and II.C.2.d above. The reflection from the headlights of a sled or automobile, and not the Snow Glow light, dominate the perceived light from a snowmobile approached from the rear. *See Id.* The field of view through which the Snow Glow system provides visibility is narrow, and does not cover the vast majority of possible approach angles. *See* ¶¶ II.C.2.e and II.C.2.f, above. The Snow Glow system cannot be moved to illuminate a larger area or the vicinity of the sled. *Id.* The Snow Glow system does not offer a significant upgrade in visibility compared to standard snowmobile reflective materials, and has significant disadvantages compared to existing supplemental lighting systems currently available in the market.

Today's snowmobiles must meet specific requirements that dictate headlamp performance, as well as reflective marking requirements. *See, e.g.* SAE J292 (Snowmobile and Snowmobile Color Lamps, Reflective Devices, and Associated Equipment), SAE J576 (Plastic Materials for Use in Optical Parts Such As Lenses and Reflex Reflectors of Motor Vehicle Lighting Devices), and SAE J578 (Color Specification). Through the efforts of snowmobile manufacturers and the standards committees, snowmobiles have experienced a widespread upgrading in headlamp performance. Alternators on snowmobiles have been upgraded to power these improvements and alternator capacity has increased from typical values of 120 watts to 280 watts on many sleds.

Even if the Snow Glow light is visible to an approaching vehicle within the required narrow approach angle it is not at all clear that the Snow Glow system would prevent a significant proportion of the accidents that allegedly result from poor visibility. Results from

research conducted on the conspicuity of trucks and the effect of additional lighting or reflectors indicated that in fact the inability to detect a stopped truck was not the key parameter involved in many accidents. The disappointing results from conspicuity enhancements revealed that the rate of change of the visual angle was the key factor drivers relied upon when making judgments about vehicles that they were approaching. If the rate of change of the visual angle was insufficient (*i.e.* the visual angle of the observed object was not increasing rapidly) the driver of the approaching vehicle could not judge the closing speed accurately although the vehicle was visible. This research is summarized in an ASME paper published in 1995 that is included as Attachment O. *See* "Visibility and Judgment in Car-Truck Night Accidents." Ayres, T.J., R.A. Schmidt, B.D. Steele and F.P. Bayan, SERA-Vol. 4, Safety Engineering and Risk Analysis, ASME 1995.

Increasing the conspicuity of the snowmobile through a point light source will not increase the rate of change of the visual angle from the light source. It will therefore not allow an approaching driver to more quickly detect a change in the visual angle and therefore will not improve the ability of the approaching driver to estimate the closing speed and time to contact. Illuminating an area or line through the use of a portable light will allow earlier detection of increased visual angle by approaching sleds. This would provide more time to perceive the closing speed and take corrective action.

This research into driver perception parallels earlier work published in 1987 in an Society of Automotive Engineers (SAE) paper on nighttime visibility (Attachment P). *See* "Visibility Problems in Nighttime Driving," Olson, Paul L. SAE Technical Paper No. 870600, 1987. This paper identified issues associated with nighttime driving and visibility. After reviewing these issues, the author concludes that something more than simple detection of the stopped vehicle is necessary in order to avoid a collision with it (Attachment P at p. 110). In fact, most unexpected objects must be detected in the periphery of the visual field. Measurements of visibility however are often taken when focusing on an object. Reliance on an "estimate of 'visibility distance' or some such parameter can yield very misleading results." *Id.*

The research cited above into the effects of increased conspicuity indicates that it is simplistic to claim that there will be a significant decrease in collisions between snowmobiles, even for just those few collisions in which visibility distance is an issue and the Snow Glow system would be visible. Increased visibility distances alone will not necessarily increase the available reaction time for many situations. As noted in the SAE Snowmobile Committee memorandum discussing the Snow Glow device, the increased visibility could also result in the "moth to the candle" scenario observed with drunk driver collisions involving stopped police cruisers and parked automobiles with flashing hazard lights.

Petitioners have failed to demonstrate that the device they are requesting be made mandatory would significantly reduce the few accidents in which such a lighting system could be relevant. The device does not significantly upgrade the visibility of the sled when approached by a vehicle with headlights, is only visible over a very narrow approach angle, and would not necessarily increase the available reaction time for those few incidents in which the light was visible.

3. Consumer Demand

There has been little or no consumer demand for the Snow Glow lighting system. The largest volume snowmobile manufacturer, Polaris Industries, offered the Snow Glow lighting system as an accessory in 2000 and 2001. The lighting system was offered through the catalog and through the dealer network. The retail price of the lighting system was $99.68. This is almost identical to the price at which Snow Glow on their website ($99.95) currently offers the system. Sales of the lighting system totaled less than 100 units in each year. There were a total of 146 units sold (96 in 2000 and 50 in 2001) at the wholesale level. Not all of these units were actually retailed. This compares to Polaris Industries snowmobile sales of over 70,000 vehicles per year. The sales statistics indicate that approximately 0.2 percent of the snowmobilers (1 in 500) were interested in the lighting system. When compared to the installed base of 2.7 million snowmobiles in North America, the sales of the Snow Glow lighting system barely registered.

The Polaris sales experience represents actual quantitative market demand data. This hard sales data, based on Polaris sales, represents the best available quantitative data on consumers' preferences and perceived need for the Snow Glow lighting system. The market demand indicates the true feelings of consumer when asked whether they are willing to pay to have a snowmobile equipped with the Snow Glow system. Overwhelmingly consumers have voted with their pocketbooks when given a choice – they have chosen not to equip their snowmobiles with the device. This consumer behavior is a much more reliable indicator of consumer interest compared to the "survey" conducted by Snow Glow on their website. The website survey responses would seem to indicate that snowmobile enthusiasts consider the Snow Glow system a very desirable device and yet consumer interest has been virtually nonexistent.

Some of the reasons that snowmobilers have not purchased the Snow Glow system are discernable from the very surveys that Snow Glow offers as evidence that the lighting system is greatly desired by the snowmobiling public. First, the majority of snowmobile operators carry a light source when they ride. Of the 135 responses to the survey, fully 97 respondents indicated that they carried a supplemental light source. That represents 71.8 percent of the survey respondents. Only 15 respondents (15.5 percent) of the respondents indicated that they did not carry a supplemental light source. Supplemental light sources included flashlights (97 respondents), strobes (4 respondents), and other light sources (18 respondents). Note: the totals may not match because some respondents may carry more than one supplemental light source and others appear not to have responded as to whether they have a supplemental light source. The ready availability of simple alternative light sources makes the Snow Glow system unnecessary for many snowmobile enthusiasts. As noted below, some of these lighting systems may have distinct advantages over the Snow Glow system (*e.g.* strobe's ability to project over a 360 degree range).

Besides the Snow Glow system, other supplemental lighting systems are available. These include a detachable strobe light that is offered by Bombardier (Part No. 295 500 544), and another separate strobe light unit offered by Arctic Cat (Part No. 0639-413). The strobe light units are detachable and may be placed high on the sled (*e.g.* windshield) to increase visibility. In addition, the Arctic Cat unit allows the strobe to be seen over a 360-degree range, greatly increasing the utility of the light in signaling the presence of the stopped sled to approaching snowmobiles. These alternative lighting systems are not based on the Light Emitting Diode

(LED) system and red and yellow colored light design sought by Snow Glow in their petition. However, they offer interested snowmobilers other valid approaches to providing supplemental lighting.

A further reason that many consumers may not be as interested as Snow Glow anticipated is that many snowmobilers have never been broken down or lost. Of the survey participants, only 43 (31.8 percent) indicated that this had ever occurred to them. Other measures taken include leaving the sled operating (30 respondents or 22.2 percent), restarting the sled (28 respondents or 20.7 percent), and removing the sled from the trail (23 respondents or 17 percent). Despite the prompting of the website, a large number of participants were not worried about a possible collision when their snowmobile was not operating (62 respondents or 45.9 percent). The complete results of the survey as of July 1, 2002 are attached (Attachment Q). While the survey design and sampled population affected the results it is clear that there are a variety of commonsense actions that snowmobilers take to minimize the risk of a collision when their vehicle is not operating. Snowmobilers are also urged to travel in groups, and many use their sleds only during daylight hours. For many of these operators those actions are sufficient and purchasing a Snow Glow system is judged to be unnecessary.

Overall, an industry-wide basis, mandating the Snow Glow system would cost consumers approximately $20 million annually. This cost is calculated based on the retail price of approximately $100 multiplied by the annual snowmobile industry volume of approximately 200,000 sleds per year. This represents a very steep societal price for a safety feature that has not been demonstrated to be effective, is not an improvement over existing lighting systems, and would not be relevant in the overwhelming majority of snowmobile accidents. A small fraction of those resources spent on prevention of impaired driving, rider education, trail maintenance, and safety regulation enforcement would have a much greater impact on snowmobile accident rates.

D. Regulatory Analysis of Snow Glow Device

1. *Failure to meet Regulatory Criteria for Petition Approval*

Under the CPSC's regulations, the Petitioner must demonstrate that (1) the product involved presents an unreasonable risk of injury, (2) a rule is reasonably necessary to eliminate or reduce the risk of injury, and (3) failure of the Commission to initiate the rulemaking proceeding requested would unreasonably expose the petitioner or other consumers to the risk of injury which the petitioner alleges is presented by the product. *See* 16 CFR §1051.9(a). Petitioner has failed to make any of the required demonstrations.

First, snowmobiles as currently designed do not present an unreasonable risk of injury. There has been no dramatic increase in overall snowmobile fatality rates. For example, the 2000-2001 Wisconsin DNR Snowmobile Incident Report shows a generally decreasing trend (18.35 in 1991-1992 dropping to 11.2 in 2000-2001) over the last decade in the fatality rate per hundred thousand registered snowmobiles. *See* Attachment B at 5.

The specific risk that Snow Glow seeks to address, the risk of a collision with a stopped snowmobile, represents a tiny fraction, if any, of the incidents that result in fatalities. As the data

cited by Snow Glow indicates none of the snowmobile fatalities in Wisconsin or Minnesota during the 2000-2001 season could be directly attributed to the lack of a supplemental lighting system. Further, in almost all of the incidents the lighting system could be definitely ruled out as a relevant factor. In the two incidents for which not enough information was available to rule out visibility issues, high blood alcohol content readings were found.

Second, Snow Glow has also failed to demonstrate that a rulemaking is necessary to eliminate or reduce the risk of injury. As just discussed, the type of accidents that would involve visibility issues addressed by the Snow Glow system are very infrequent. Even if these types of accidents were assumed to be significant, the Snow Glow system has not been shown to be effective in reducing the estimated number of these accidents. The Snow Glow system is not superior to existing supplementary lighting systems, the Snow Glow system is available to any snowmobilers who desire to purchase the unit as an aftermarket accessory, and snowmobilers can and do use other readily available lighting sources.

Third, Snow Glow has failed to demonstrate that failure of the Commission to initiate a rulemaking would unreasonably expose the petitioner or other consumers to the risk of injury from snowmobile collisions with stopped sleds. As shown above, most accidents result from inappropriate driver behavior (examples: impaired driving (alcohol) or excessive speed) in which the Snow Glow device is not relevant. These accidents can best be reduced through other means such as rider safety regulation enforcement, rider education, trail maintenance, and prevention of impaired driving.

Almost none of the accidents result from the scenario that the Snow Glow device is intended to address, that is a collision from directly ahead or behind a stopped sled at night in which visibility is an issue. Conducting a rulemaking to require Snow Glow lights would not address the vast majority of snowmobile accidents and therefore failure to conduct such a rulemaking would not unreasonably expose the petitioner or other consumers to the risk of injury

2. Low Regulatory Priority Based on Lack of Safety Need

Even assuming that the Petitioner had met the regulatory criteria for initiating a rulemaking, the Commission's rulemaking priority policy places emphasis on the frequency and severity of the injuries, and the amenability of an alleged product hazard to risk reduction through standard setting, information and education. Other factors include the vulnerability of the population at risk (*e.g.* elderly or children), the unforeseen nature of the risk, the costs and benefits associated with such measures, the potential for future injuries or chronic effects, and the probability of exposure to the risk. *See* 16 CFR §1009.8(c).

As noted above, based on a review of the available data, there are very few injuries or fatalities that result from the scenario addressed by Petitioner. Thus, given the lack of severe injuries and fatalities, there should be a very low priority placed on conducting any rulemaking activity related to the Snow Glow petition. Snowmobile accidents are largely the result of driver behavior and can best be addressed through driver education efforts and dissemination of safety information. Historically, this function has been handled by local snowmobile organizations, state agencies, and other grass roots efforts. It appears that these efforts are succeeding. For example, the 2000-2001 Wisconsin Snowmobile Incident Report (Attachment B), reports a steep

decline in alcohol related fatalities, dropping from 75 percent in 1998-1999 to 66 percent in 1999-2000, and dropping further to 46 percent in 2000-20001. All of this militates against assigning a high priority to conducting a rulemaking to require mandatory supplementary lighting systems.

Other factors that are important in assigning priorities include the fact that the exposed population is composed largely of young adult males. *See e.g.* Attachments B, C and G. This is not a "vulnerable" population (children or the elderly) that merits a high priority. The risk of driving into objects (*e.g.* trees, fences, etc.) while operating at night is well known and is not unforeseen. Snowmobile rider education efforts regularly cite this hazard (*e.g.* CPSC's own snowmobile safety tip sheet available at: http://www.cpsc.gov/CPSCPUB/PUBS/541.html warns about the risk of unseen objects when traveling at night). *See* Attachment R. Riders are urged not to drive faster than prudent given the range of their lights. *Id.* The costs of the supplementary lighting system ($20 million annually) is also high compared to other measures that can have a greater impact in reducing accidents (*e.g.* rider training, trail maintenance, local safety regulation enforcement). The potential for future injuries is decreasing each year as rider education efforts continue, as new riders receive mandatory training courses required under individual state laws, and as the prevalence of impaired driving decreases. All of these factors weigh heavily in assigning a very low priority to any rulemaking involving supplemental lighting systems on snowmobiles.

3. Actions by Other Governmental Entities

Of interest to CPSC should be the actions taken by other governmental agencies to reduce snowmobile accidents and improve rider safety. Only one state, Minnesota, has considered directly mandating snowmobile lighting systems such as that produced by Snow Glow. This issue was addressed by the Minnesota legislature in both 1998 and 2000. *See* House Bill H.F. 2485, 80th Leg. Sess., 1998; Senate Bill S.F. 2144, 80th Leg. Sess., 1998; House Bill H.F. 3479, 81st leg. Sess., 2000; and Senate Bill S.F. 3471, 81st Leg. Sess., 2000. In both instances, the Minnesota legislature declined to enact legislation requiring supplemental lighting systems on snowmobiles.

There are indications in the Snow Glow Petition that even some of the legislators who introduced the bill were not convinced of its merit. Specifically, in a letter dated March 24, 1999 from Snow Glow to the Office of the Governor, Al Lakosky, the President of Snow Glow, states that "it seems the only reason why they took interest is to get their own names out on some new bills for their own opportunities for notoriety and career advancement." *See* Petition at p. 18. Mr. Lakosky goes on to state that one of the legislators who assisted Snow Glow stated "you really didn't want this bill to pass, did you? I thought we were just going to get the attention of the manufacturers so that they would make you an offer on the lighting system." *Id.* at 19. In any event, the one governmental body that considered making supplemental snowmobile lights mandatory rejected adopting such a requirement.

State governments have traditionally been very active in regulating snowmobile usage. These activities include requiring licenses or permits to operate on state lands, establishing mandatory safety training for riders born after a given date, setting minimum age requirements for snowmobile operation, requiring accident reports whenever substantial property damage or

injury results from a snowmobile accident, establishing and enforcing blood alcohol limits (DUI-type laws) that apply to snowmobile operators, setting maximum speed limits for snowmobile operation, establishing and maintaining trails systems for snowmobile use, reporting annual snowmobile accident and fatality trends, and conducting public service campaigns regarding the dangers of inappropriate rider behavior. These activities are also supported by local governments and snowmobile organizations that help conduct training classes, aid in trail maintenance, organize riding groups, and encourage responsible riding behavior. A brief summary of various state snowmobile laws and regulations can be found at: http://www.snowmobileacsa.org/page.cfm/17/. This list is attached (Attachment S).

These activities are largely directed at reducing snowmobile accidents. The snowmobile organizations and state governments have determined that these activities best address the safety issues associated with snowmobile operation. As noted above, operator behavior is the primary factor determining the frequency of accidents. By addressing rider behavior issues, state and local governments are addressing the key factors that can continue to improve snowmobile safety and keep accidents to a minimum. Spending $20 million annually through a requirement for mandatory supplemental lighting systems is inefficient and would fail to address the actual causes of most snowmobile accidents.

III. Conclusion

We appreciate the opportunity to comment on the Snow Glow Petition. For a multitude of reasons, ISMA concludes that the Snow Glow Petition should not be approved by the CPSC. Snow Glow has not demonstrated that there is a substantial safety risk that should be addressed through a rulemaking. Snowmobiles as currently marketed (without a Snow Glow lighting system) do not present an unreasonable risk of injury. Under the CPSC's regulations a showing of a substantial safety risk is a prerequisite to approving the petition to proceed with a rulemaking establishing a hazard lighting system standard.

Even if a substantial safety risk were to arise, there has been no demonstration that a rule mandating devices such as the Snow Glow device would have any measurable effect on snowmobile safety. The available data indicates that the lighting system would not have a significant effect on snowmobile accident rates. Thus, Petitioner has not demonstrated that the specific requirements for the proposed hazard lighting system would be effective in reducing such a risk.

The CPSC petition represents the latest round in Snow Glow's unceasing efforts to make their potential lighting system a required feature on the 200,000 snowmobiles manufactured annually. *See* U.S. Patents 6257744, 6109769, 5598065, Canadian Patent 2251417. Snow Glow has requested that their lighting system be mandated or recommended by (1) The Minnesota legislature (2) the SAE Snowmobile committees, (3) ISMA, and (4) the individual state and international snowmobile organizations. (*See* Petition at p. 97), and individual snowmobile manufacturers. None of these organizations or authorities has concluded that the Snow Glow system should be required on snowmobiles.

Improving snowmobile safety is an important task that ISMA and its member companies take seriously. Snowmobile accidents have numerous causes; however, the alleged safety risk

that the Petitioner seeks to address with the Snow Glow hazard lighting system is not a significant factor. Through rider education programs, prevention of impaired driving, improvements in trail and riding areas, and simple operator precautions the vast majority of accidents can be prevented. ISMA, its member companies, snowmobile organizations, and state and local governments all devote significant resources towards improvements in these areas. Through these efforts a significant reduction in snowmobile accidents is being attained, a safety improvement that far outweighs any hypothetical gains from the Snow Glow lighting system.

Attachment A is a video tape and

is enclosed separately

B

Wisconsin
Department of Natural Resources
Snowmobile Incident Report
2000-2001

PO Box 7921

Madison WI 53707-7921

PUBL-LE-203 (Rev. 07/01)

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2000-2001 Snowmobile Program Report
Summary

The 2000-2001 Snowmobile Program Report was compiled from the 26 fatal investigations and other data collected during the fiscal year 2000-2001 (a fiscal year runs from July 1 – June 30).

Conservation Wardens investigate all fatal snowmobile incidents and as such, Wisconsin law requires that a conservation warden or law enforcement officer be notified immediately of any snowmobile incident that results in an injury requiring medical treatment by a physician. In addition, the operator(s) involved in these reportable incidents must file a written report with the Department of Natural Resources within 10 days, insofar as they are capable of doing so.

FATAL INCIDENT CAUSES

The leading cause of death was striking a fixed object such as trees/posts. The secondary cause of death was striking another snowmobiler or being struck by a snowmobile. The leading contributing factors were excessive speed and alcohol consumption.

There were 11 (13 the previous year) fatal crashes that investigators could directly identify excessive speed as a contributing factor to the death of the operator/passenger. Of the 11 speed related fatals, 7 of those who died had consumed alcohol or 63% (77% the previous year) of the speed related victims.

Alcohol was identified as another contributing factor. The law expressly states a person is under the influence of alcohol once their blood alcohol level reaches 0.10. Forty-six percent or 12 of the victims who had known toxicology reports performed, showed they had consumed some alcohol. There were 5 victims that were not able to be determined and 9 victims had no alcohol in their system at the time of death. Of the total number of victims who had consumed alcohol, 67% had a blood alcohol reading of 0.10 or higher. Two of the blood alcohol levels were determined to be 0.20 and above.

WHO WAS INVLOLVED

All of the victims were male except one. The victim's ages ranged from 4-67 years, with the average age, 31.5 years. Of the 26 fatal incidents, 21 of the victims were Wisconsin residents while 2 were from Michigan, 1 from Minnesota and 2 were from Illinois. The largest percentage of victims was age 21-29 or 38% (39% the previous year). The second largest age group was tied between age 40-49 and age 16-20, with both showing 15% (30-39 (27%). One child under 16 was killed this reporting period. The majority of the victims had not received formal Snowmobile Safety Training. Of the 26 victims, 22 were known to have been wearing a helmet, and 4 were not known.

WHEN DO THE FATAL INCIDENTS OCCUR

A correlation was observed by reviewing fatality statistics for the past eight years. Inferences can be drawn as to the time of day the incidents occur and day of the week. Not surprising, the majority of the people killed while snowmobiling, were fatally injured on Friday, Saturday or Sunday.

The time that people were most likely to be involved in a deadly incident is between the hours of 8:00 pm - 3:00 am.

FACTORS TO BE CONSIDERED

The 2000-2001 snowmobile season was the first time snowmobilers were subject to a statewide nighttime speed limit. The speed limit prohibited operation of a snowmobile at speeds above 50-mph during the hours of darkness. The hours of darkness was defined as 1/2 hour after sunset until 1/2 hour before sunrise. The speed limit was temporary and expired May 2001. As of this report no statewide speed limit is in effect or being considered for 2001-2002 and beyond.

A second consideration is the affects of the weather and snowfall. The 2000-2001 season began in December under optimal conditions statewide. For the first time in years, the southern portion of the state recognized ample snowfalls, which allowed trails to open in early December, much earlier than years past. The amount of time the southern trails stayed open was considerably longer than previous years and many trails stayed open well into February for most counties. Some of the northern counties kept trails open from December until the close of the season at the end of March.

Wisconsin experienced a mid-January thaw, which temporarily closed many trails until temperatures dropped low enough to allow snow to re-accumulate. Sparse snowfalls in February left some trails without substantial snowfall, which would have normally covered icy trail conditions. During January and February, trails in the southern portion of the state continued to degrade without the required snowfall while the north maintained good to fair conditions.

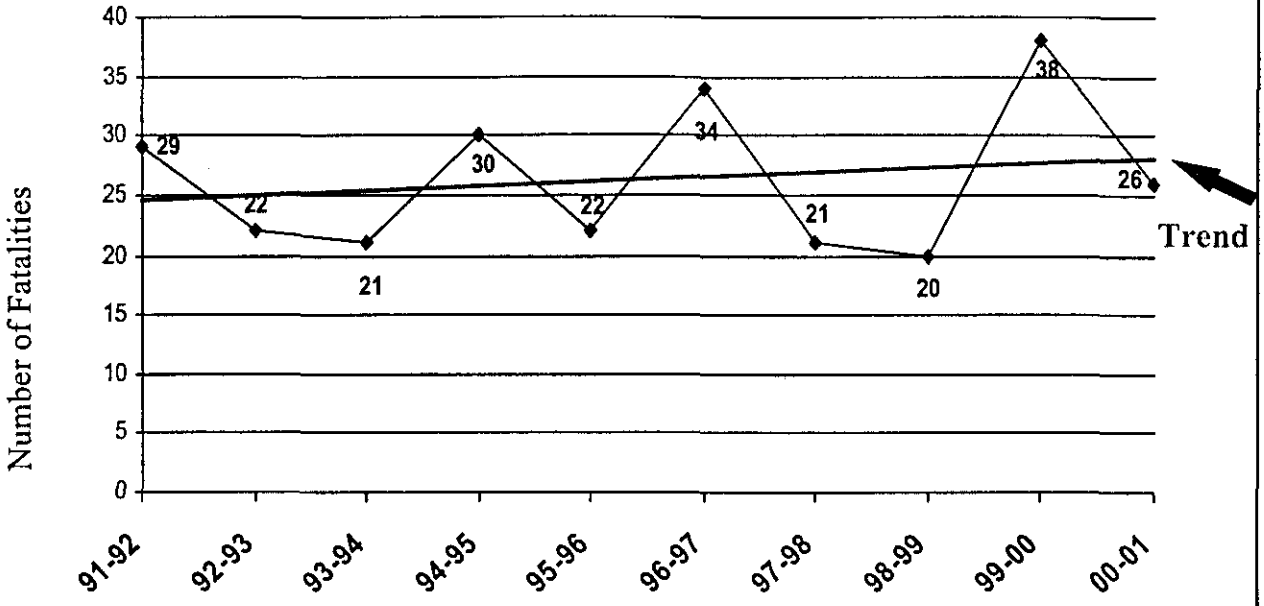
Lake and river freeze-up throughout the state occurred early and may have had an affect on the number of water related snowmobile fatals. One water-related fatal occurred early in December and two occurred late in March. Abundant snow created a false impression that ice was rideable, however water related fatals were not highlighted as in the previous year. The Department actively warned snowmobilers about operating on ice throughout the season and a heightened awareness through exhaustive media messages may have prevented a higher number of ice/water related incidents.

National reports concluded that alcohol as a contributing factor for snowmobile deaths was reduced. There is no objective data to conclude the reason for the reduced figures, however officials from an international perspective speculated that the reduction could be developing because of social change.

Wisconsin's 2000-01 reduction in alcohol involved incidents was no different than that of the National trend.

Alcohol Involved Fatal Incidents		
1998-99	1999-00	2000-01
75% Involved	66% Involved	46% Involved

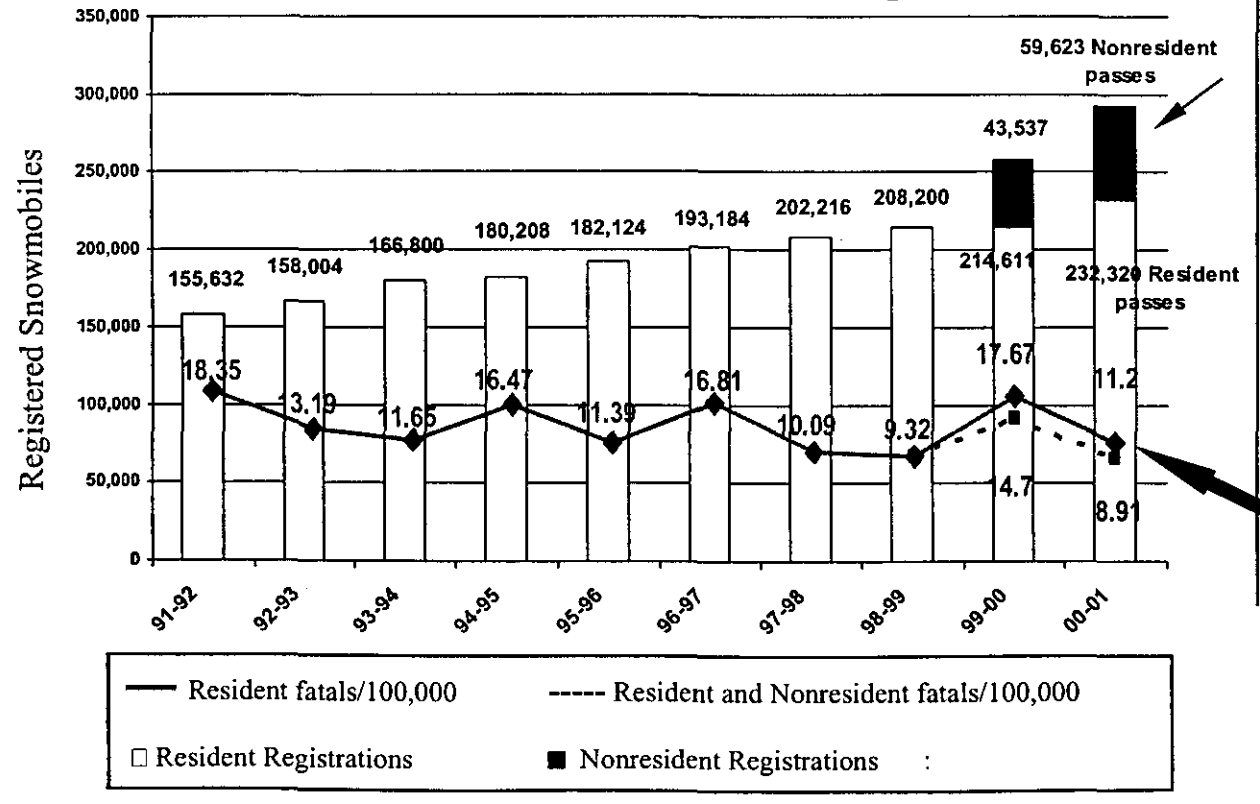
History of Snowmobile Fatalities



The 10-year fatal average is 26.3 deaths per year.

The amount of snowfall and number of hours ridden, are not reflected and can effect the number of fatals that occur.

Snowmobile Fatality Rate to Number of Snowmobiles Registered



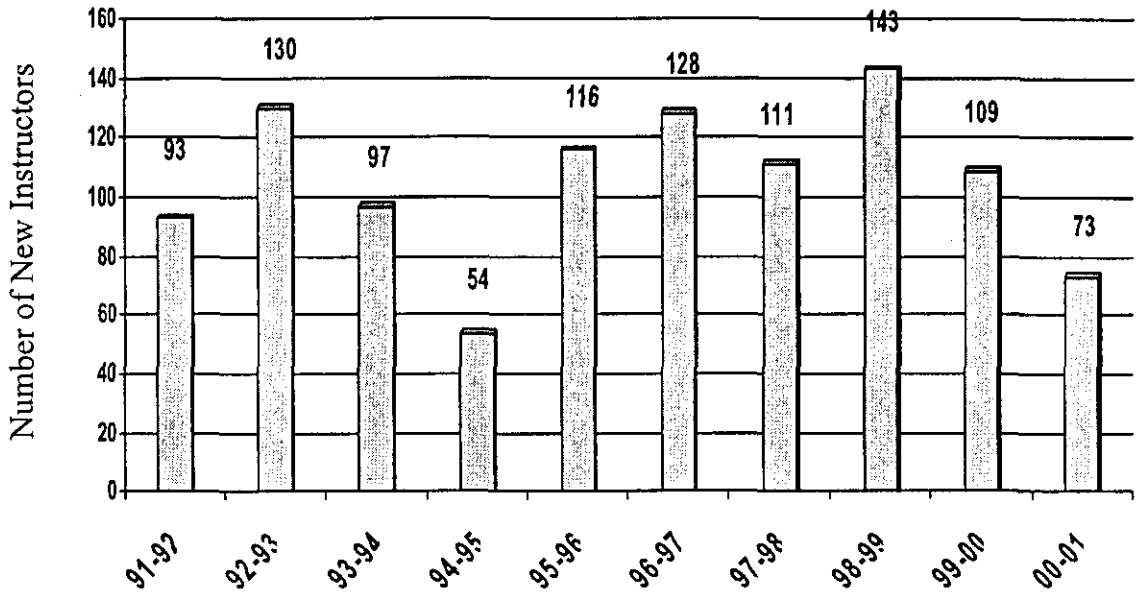
Beginning the 1999-2000 season, the nonresident trail pass became a requirement for all snowmobiles not registered in WI. The Department was able to identify the number nonresident snowmobiles.

A statewide nighttime speed limit of 50-mph was adopted in December 2000 and lasted for 150 days.

Fatals per 100,000 Registrations.

History of Snowmobile Education
Instructors Certified

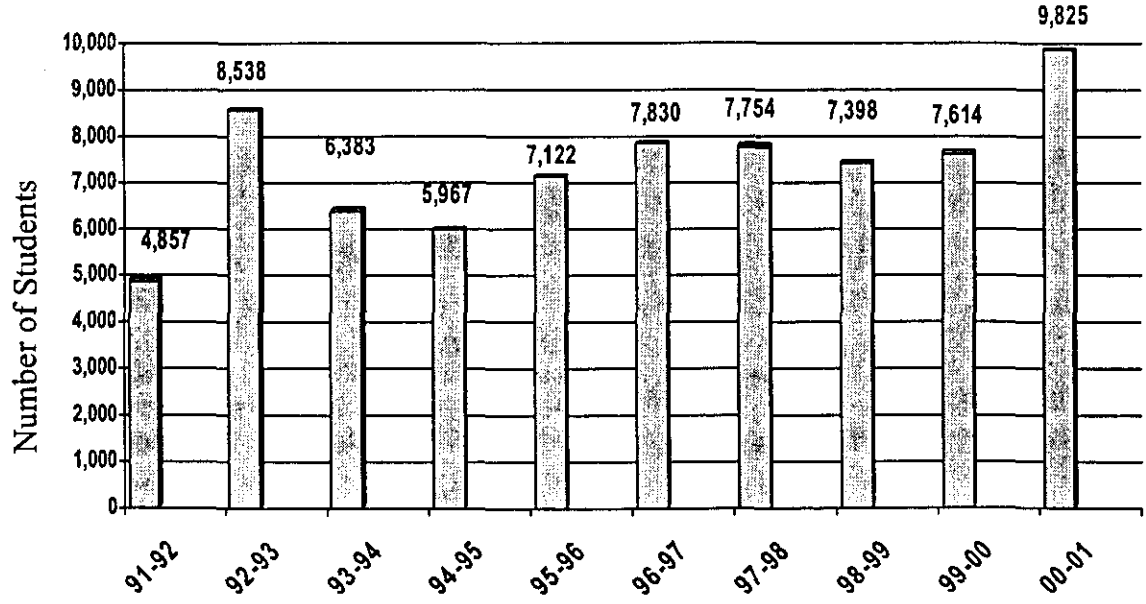
The total number of active instructors statewide for 2000-2001 was 1,230.



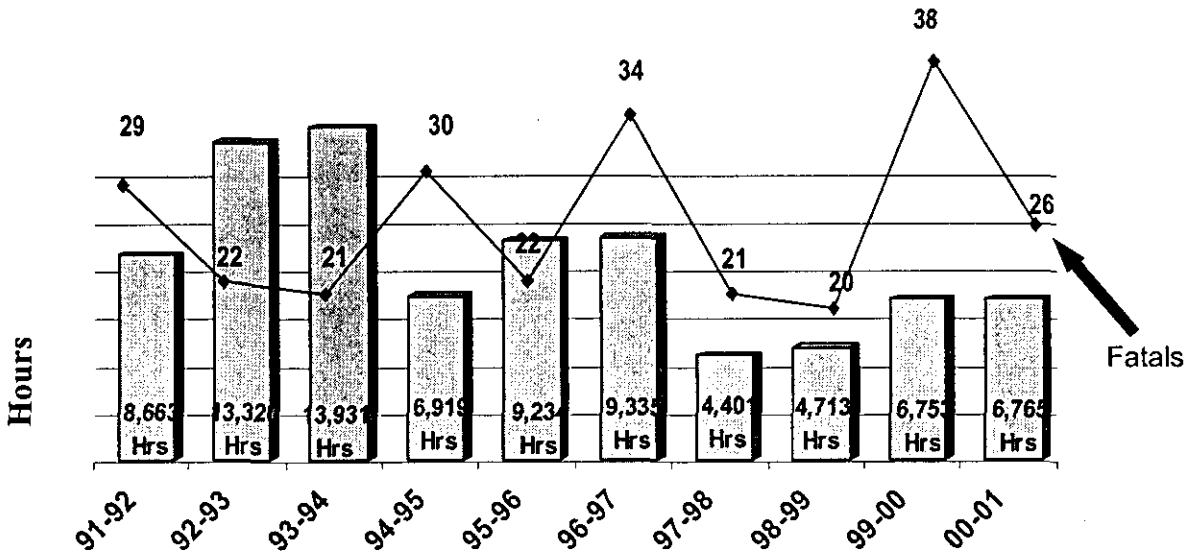
Over 198,638 students have been certified by instructors since *certification* became required of youth, October 1, 1973.

History of Snowmobile Education
Students Certified

Beginning January 1, 2001 all persons born after January 1, 1985 were required to be certified before operating a snowmobile.



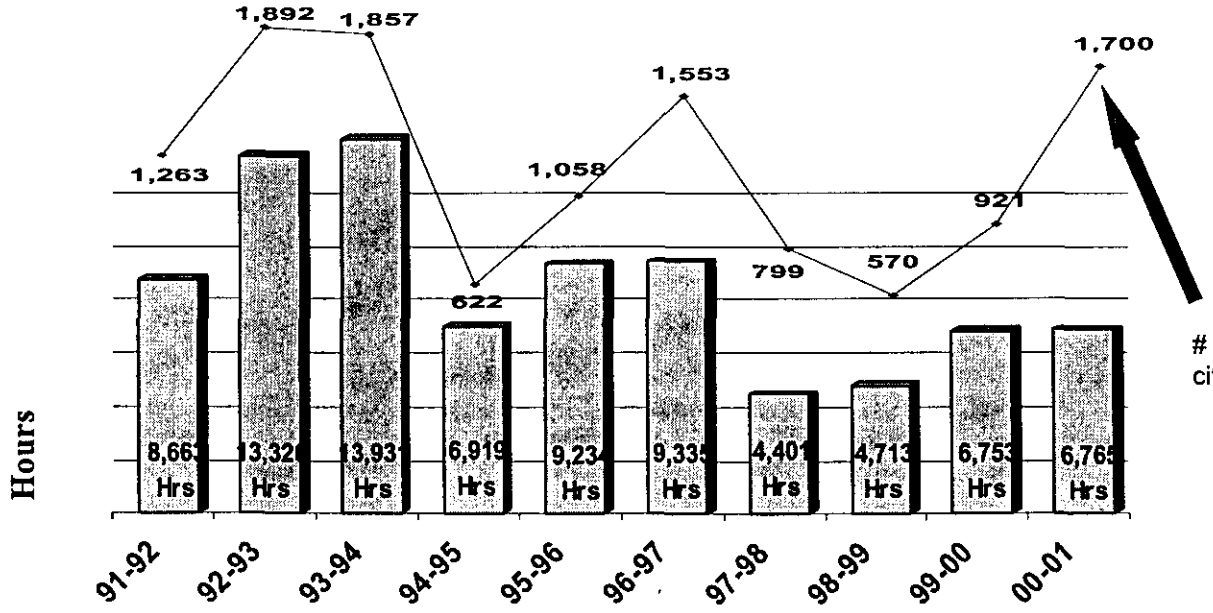
History of Snowmobile Fatality Rate to Enforcement Hours



The enforcement hours were further broken down in 1999-*2000 and* became more representative of the actual enforcement hours used.

Beginning 1999-2000, enforcement hours no longer included time *involved with* court, snowmobile maintenance, etc.

History of Snowmobile Citation Rate to Warden Enforcement Hours



The citations for sheriff patrols and wardens were combined for the first time 2000-2001.

Prior to 2000-2001, the citations listed are for wardens only.

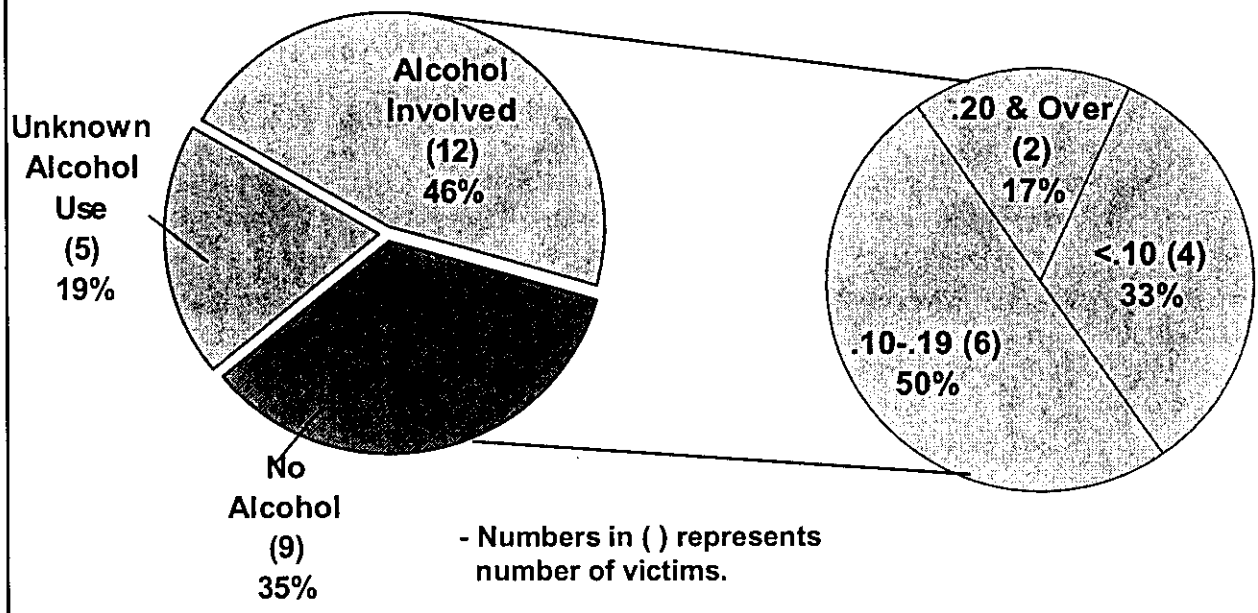
2000-2001 Alcohol Involved Snowmobile Fatals

The previous ten-year average blood alcohol level was 0.156.

2000-2001 Blood alcohol level dropped to 0.113.

Past years show that alcohol was a contributing factor in 75% of the fatals..

The 2000-2001 season showed that alcohol was a contributing factor in 46% of the fatals.

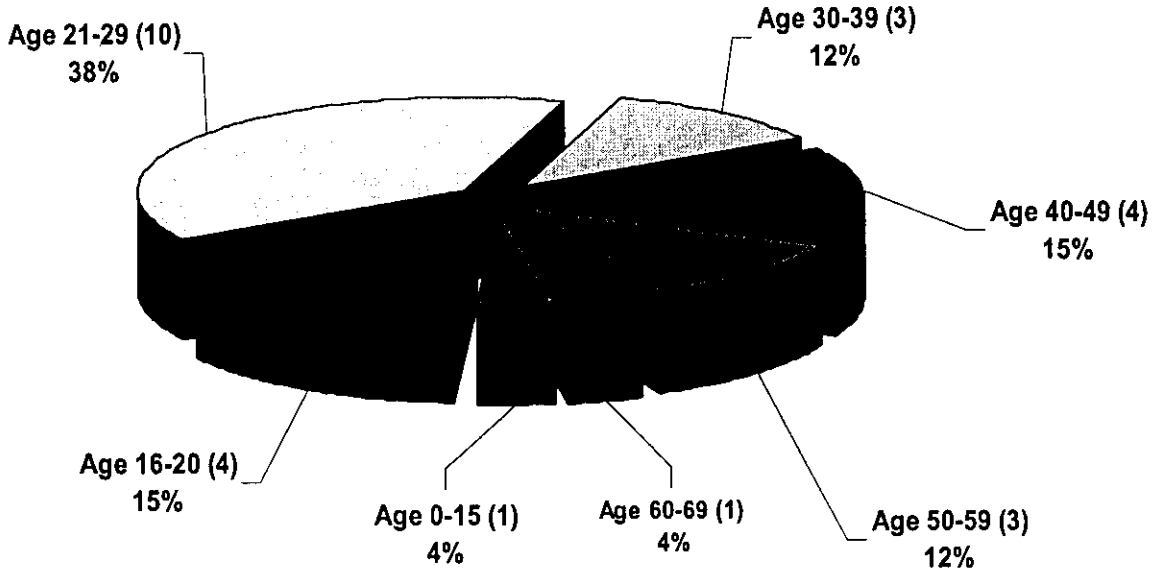


- Numbers in ( ) represents number of victims.

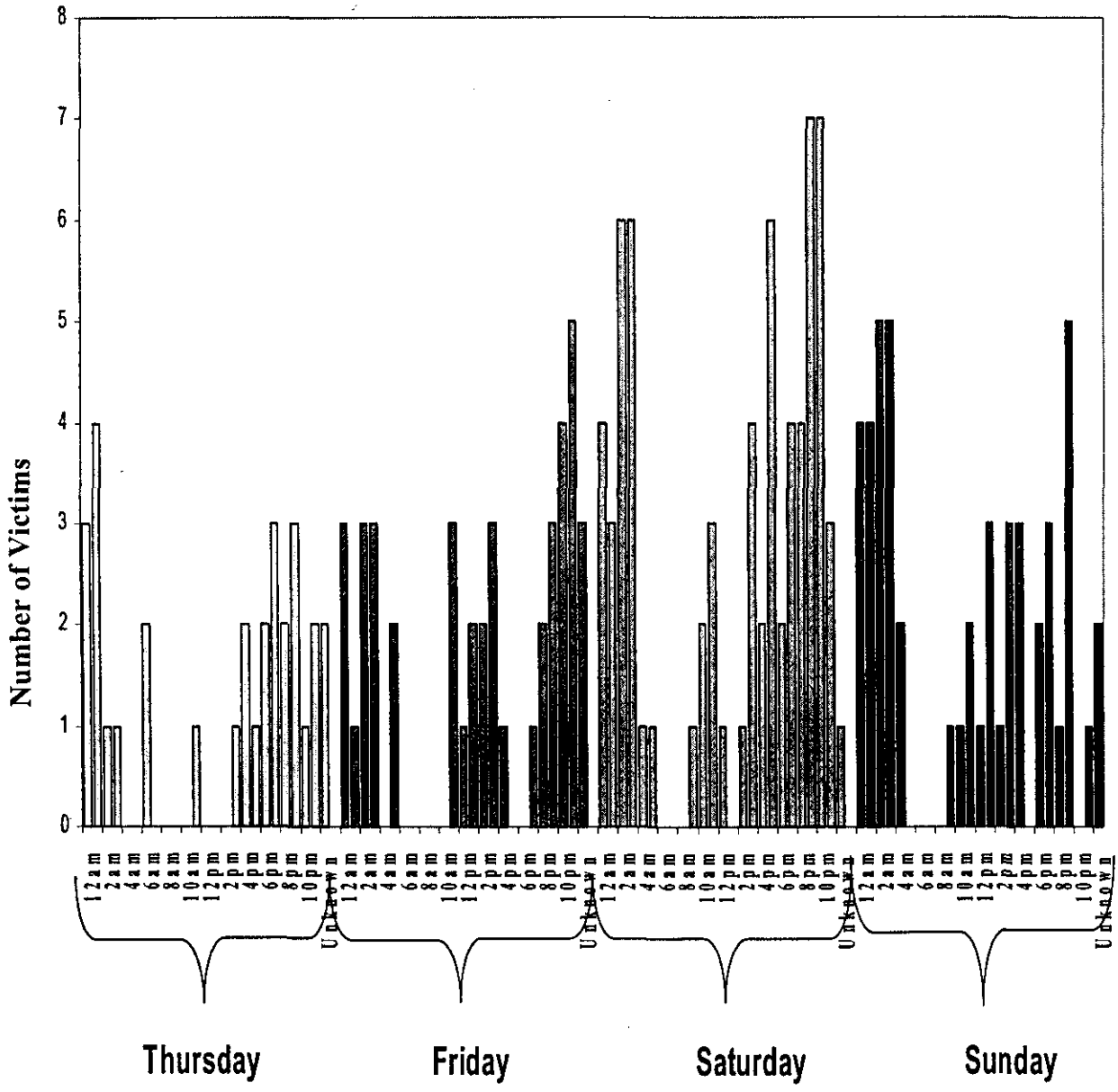
- Blood alcohol content is grams /ml.

2000-2001 Age of Snowmobile Fatality Victims

The average age for the victims killed was 31.5 years old as compared to 34 years in 1999-2000.



Wisconsin Snowmobile
Fatal Incidents by Time of Day
on Weekends, 1992-1993 to 2000-2001



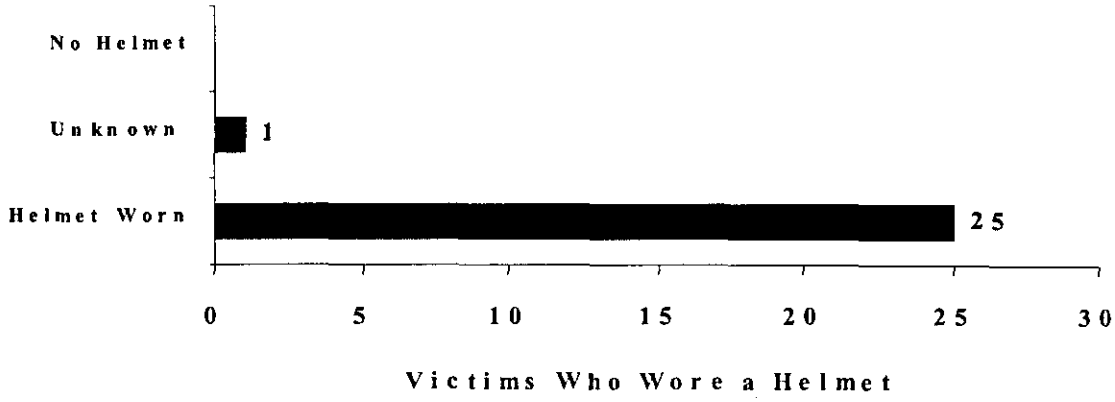
Fatal incidents have the highest frequency of occurrence on Saturdays.

The early morning hours generally involve single operator incidents.

2000-2001 Fatal Snowmobile Victims Who Were Wearing Helmets

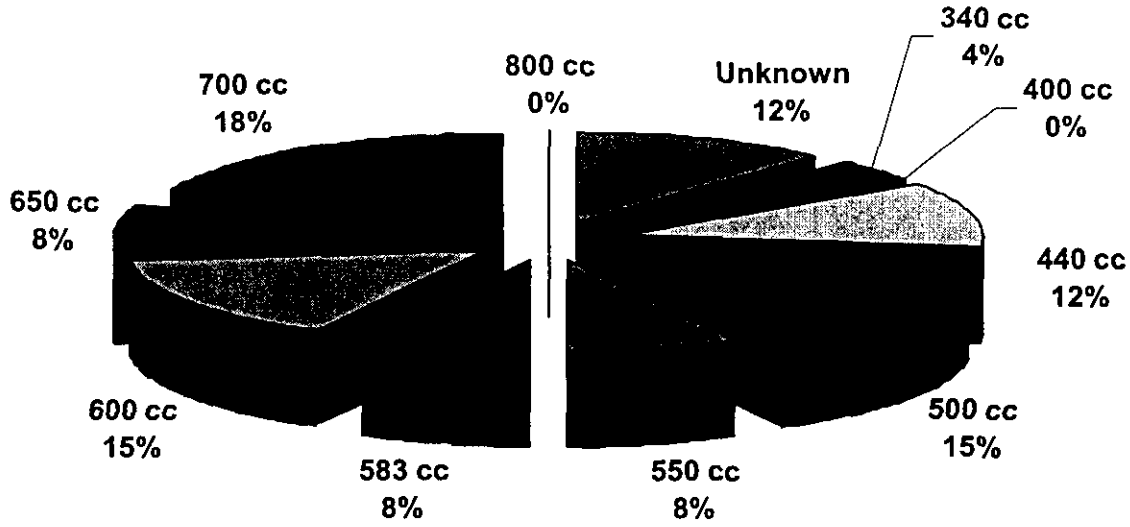
Victims traditionally wear helmets.

Unknown helmet use is because the victim was missing (drowned) or the helmet was not on the victim at the time of discovery.

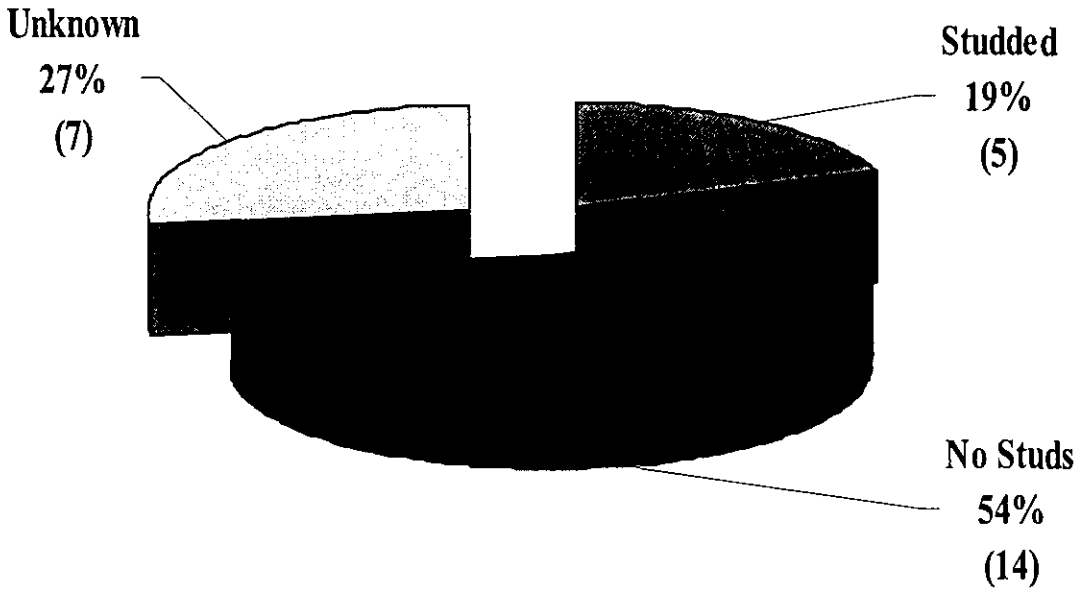


2000-2001 Size of Engine Displacement Involved in Fatal Snowmobile Incidents

Historically, the 500 cc engine-powered snowmobile has made up the greatest number of snowmobiles involved in fatal incidents.



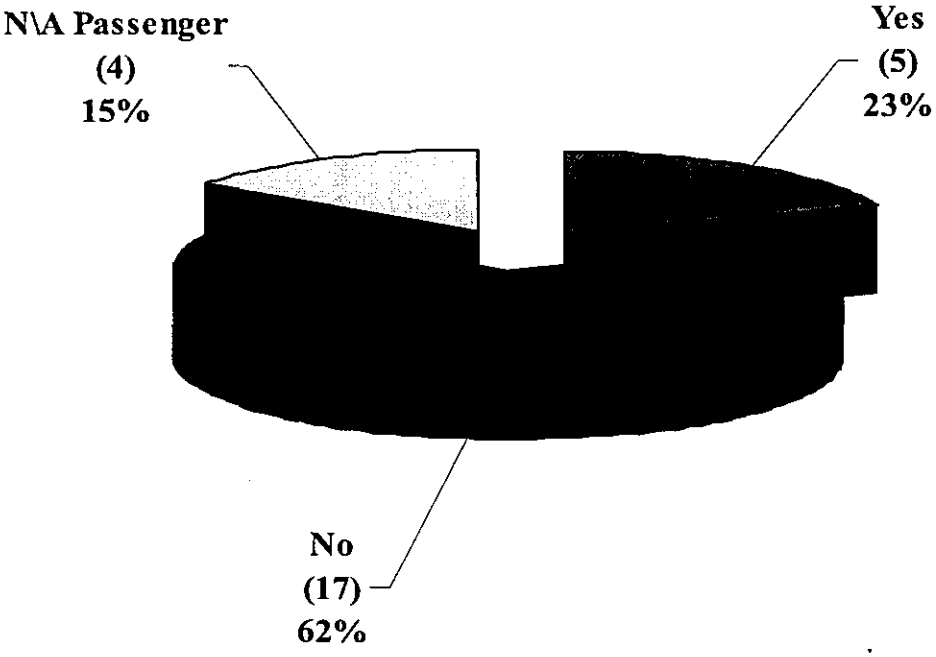
2000-2001 Snowmobiles Involved in Fatals Equipped with Studded Tracks



Most fatal incidents do not involve machines that are equipped with studded tracks.

Studded track information does not include a comparison to the general snowmobile population and overall stud use.

2000-2001 Fatal Snowmobile Victim Operators with Wisconsin DNR Safety Training Certification



Beginning January 1, 2001 - A Snowmobile Safety Certificate became required for all operators born after January 1, 1985.

2000-2001 Citations Issued for Snowmobile Violations

Total Citations 1,700

Operate Snowmobile w/o Valid Registration (S-1) 177
Fail to or Improper Display of Registration Number or Decal (S-2) 157
Operate Snowmobile w/o Possession of Valid Certificate (S-3) 83
Fail to Transfer Registration of Snowmobile (S-4) 18
Give Permission to Operate a Snowmobile not Registered (S-5) 37
Transport Uncased Strung Bow on a Snowmobile (S-09) 1
Shoot From a Snowmobile (S-10) 2
Operate in Prohibited Area on Lands Controlled by DNR (S-11) 8
Highway and Roadway Violations (S-12) 220
Equipment Violation (S-14) 3
Permit Operation by Person Incapable Because
of Age, Physical or Mental Disability (S-15) 22
Fail to Report Snowmobile Accident (S-16) 8
Operate at/in Unreasonable, Improper or Careless Speed/manner (S-17) 110
Fail to Display Lights when Required (S-18) 1
Trespass 'Sec. 350.10(6) through (13) Wis. Stats.' (S-19) 82
Miscellaneous (S-20) 3
Dealer Failing to Collect Fee & Submit Registration Applications (S-21) 1
Fail to Stop for Law Enforcement Officer (S-22) 7
Fail to Render Aid (S-23) 1
Operate Snowmobile while Intoxicated (S-24) 93
Operate Snowmobile with Alcohol Concentration Above .1% (S-25) 75
Refuse to Take Intoxicated Snowmobile Test (S-26) 6
Absolute Sobriety for Persons Under 19 (S-27) 1
Operate Snowmobile that Makes Excessive or Unusual Noise (S-28) 167
Operate Snowmobile w/o Muffler on Engine (S-29) 0
Cause Injury by Intoxicated Operation of Snowmobile (S-30) 0
Operate w/o Trail Use Sticker (S-33) 211
Operate (Manufacture or Seller) Snowmobile w/o Functioning Muffler (S-34) 10
Fail to Comply with Regulatory Signs (S-35) 192

Change - The Citations for Sheriff Patrols and Conservation Wardens were combined for the first time 2000-2001.

Wisconsin Snowmobile Fatality Summary - 2000-2001 Season

Incident #	Date Time	Location	Type Cause	Age Sex	BAC Residency
1.	12-10-00 16:46	Milwaukee River Ozaukee County (Lake)	Fell through ice Drowning Alcohol/speed	24 Male	0.210 WI
Victim fell through ice while operating a snowmobile.					
2.	12-23-00 17:30	Catfish lake Vilas County (Lake)	Struck by another snowmobile Head, neck chest trauma Speed/vision	45 Male	0.026 WI
Victim was thrown from the machine onto the snowmobile trail and was hit by a following snowmobile.					
3.	12-26-00 13:10	Town of Hartland Shawano County (Public trail)	Collision w/ fixed object and another snowmobile Chest trauma	21 M	0.00 WI
Victim hit a stop sign and another snowmobile.			Speed/inexperience		
4.	12-26-00 23:00	Town of Cooks Chippewa County (Public trail)	Struck by another snowmobile Head trauma Follow too close/speed	19 Male	0.00 WI
Victim passenger fell off the snowmobile and was struck by a following machine.					
5.	12-31-00 18:25	Town of Colby Clark County (Private land)	Struck by following snowmobile Head, neck trauma Speed/alcohol	39 Male	0.025 WI
Victim's snowmobile broke down. The victim then became a passenger on another snowmobile and fell off after hitting a bump. The victim was struck by following snowmobile.					
6.	01-01-01 13:45	Town of Tomah Monroe County (Public road)	Struck by automobile Massive body trauma Operate on road/fail to yield	24 Male	0.00 WI
Snowmobile was being operated on wrong side of road facing oncoming traffic. When the snowmobile started to cross road, the snowmobile was struck by truck.					
7.	01-14-01 12:30	Town of King Lincoln County (Hwy. right of way)	Struck by automobile Massive body trauma Operate on road/fail to yield	56 Male	0.151 IL
Victim was struck in ditch along roadside. While the snowmobile was being pushed, the track of the snowmobile suddenly caught, projecting the snowmobile out onto county road. An oncoming automobile struck the snowmobile & operator.					
8.	01-20-01 16:15	Town of Ripon Fond du Lac County (Public trail)	Struck a tree Head trauma Unfamiliar with area/speed	30 Male	0.00 WI
Victim was the 4th snowmobile in a group of four. The victim missed a right-hand turn, left the trail and struck a tree.					

Incident #	Date Time	Location	Type Cause	Age Sex	BAC Residency
9.	01-20-01 16:23	Town of New Haven Adams County (Public trail)	Struck a Tree Head, neck trauma Speed/alcohol	40 Male	0.164 IL
Victim was operating on public snowmobile trail lost control of his snowmobile and hit trees.					
10.	01-20-01 18:30	Connors Lake Sawyer County (Public trail)	Struck a tree Massive body trauma Alcohol/speed	44 Male	0.122 WI
Victim was riding near a lake, left the trail and hit a tree.					
11.	01-24-01 20:45	Town of Cooks Chippewa County (Private trail)	Struck by another snowmobile Neck, chest trauma Speed	28 Male	0.029 WI
Two snowmobiles were operating on a private trail approaching the crest of a hill in opposite directions. The two snowmobiles collided at the crest of the hill. The operator and passenger (victim 12) were on the same snowmobile.					
12.	01-24-01 20:45	Town of Cooks Chippewa County (Private trail)	Struck by another snowmobile Neck, chest trauma Speed	4 Female	N/A WI
Two snowmobiles were operating on a private trail approaching the crest of a hill in opposite directions. The two snowmobiles collided at the crest of the hill. The operator (victim 11) and passenger were on the same snowmobile.					
13.	01-29-01 13:45	Town of Baldwin St. Croix County (Private land)	Hit a rope Head trauma Inattentive driving	18 Male	0.00 WI
Victim hit rope connected to posts as he was returning home from school on a snowmobile.					
14.	02-03-01 17:15	Town of Bashaw Washburn County (Private land)	Struck by another snowmobile Head trauma Speed/careless operation	21 Male	0.00 WI
Victim and a 2nd snowmobiler were operating on private property. The victim and the 2nd snowmobiler collided head on.					
15.	02-03-01 17:56	Town f Richfield Wood County (Private land)	Struck a wire fence C-Spine trauma Speed/alcohol	25 Male	0.108 WI
Victim was operating snowmobile adjacent to the Hwy. The victim struck a 3-strand smooth wire fence. The victim was struck in the throat and head.					
16.	02-07-01 16:46	Town of Pine River Lincoln County (Public trail)	Struck a tree Chest trauma Too fast for conditions/equipment failure	67 Male	0.00 WI
The victim was southbound on trail where the trail turned to the west. The victim failed to negotiate the 90-degree turn, left the trail and struck a tree, which was 2 feet off of the trail.					

Incident #	Date Time	Location	Type Cause	Age Sex	BAC Residency
17.	02-10-01 01:00	Town of Lincoln Forest County (Public trail)	Struck a tree Neck trauma Speed/visibility	23 Male	0.043 WI
Victim failed to negotiate the 90-degree turn, left the trail, and struck a tree.					
18.	02-12-01 23:45	Town of Wolf River Outagamie County (Private land)	Snowmobile overturned Head trauma Alcohol/speed	23 Male	0.120 WI
Victim left the trail and proceeded into & through a ditch line. After striking brush and branches in the ditch, the victim's snowmobile flipped over throwing victim off.					
19.	01-19-01 13:10	Town of Siren Burnett County (Public road)	Struck by automobile Internal trauma Fail to yield	20 M	N/A WI
Victim was struck by a truck while crossing a Hwy. and received multiple injuries. The victim was placed on life support until 02-13-01.					
20.	02-18-01 00:05	Town of Matteson Waupaca County (Public trail)	Struck a tree Head, neck chest trauma Alcohol/speed	34 M	0.156 WI
Victim was in a party of 8 snowmobiles touring the trails when the victim failed to negotiate a 90-degree turn. The victim's snowmobile hit a hard snow berm, sending victim airborne off the snowmobile, where he struck a tree.					
21.	02-21-01 14:40	Town of Stratford Marathon County (Public trail)	Struck a tree Head, chest trauma Speed/change in trail condition	25 M	0.00 WI
Victim's snowmobile hit a snowdrift, became airborne striking the trail. The victim was ejected from the machine and struck a tree.					
22.	02-23-01 15:00	Town of Plainfield Waushara County (Public road)	Struck by Automobile Internal trauma Fail to yield	52 M	0.00 WI
Victim was hit by pickup truck while crossing a road.					
23.	02-17-01 11:50	Town of Washburn Bayfield County (Public trail)	Collision w/another snowmobile Internal trauma Fail to yield/speed	16 Male	N/A MN
Victim and another snowmobile collided on a public trail (forest road). The victim passed away 02-23-01.					
24.	02-24-01 0018	Town of Lakewood Oconto County (Public road)	Struck a tree Head trauma Speed/alcohol	24 Male	N/A WI
Victim was operating on a road not designated as a route and failed to negotiate a curve. The victim became airborne striking a tree.					

Incident #	Date Time	Location	Type Cause	Age Sex	BAC Residency
25.	03-15-01 00:30	Green Bay Marinette County (Lake)	Fell through ice Drowning Visibility/alcohol	43 Male	0.212 MI

Four males on 4 separate snowmobiles were traveling to Menominee MI, from Sturgeon Bay and became disoriented due to fog. Two of the riders went through the ice and were rescued by companions. The four men then road double on the two remaining snowmobiles. As they continued to find their way, the victim operator and his passenger (victim #26) rode onto very thin ice and were lost in the water. The victim operator was recovered on 3-18-01.

26.	03-15-01 00:30	Green Bay Marinette County (Lake)	Fell through ice Drowning Visibility/alcohol	55 Male	Unknown MI

Four males on 4 separate snowmobiles were traveling to Menominee MI, from Sturgeon Bay and became disoriented due to fog. Two of the riders went through the ice and were rescued by companions. The four men then road double on the two remaining snowmobiles. As they continued to find their way, the operator (victim#25) and victim (passenger) rode onto very thin ice, both men were lost in the water. The victim (passenger) is still missing.

SLOW DOWN

...RIDE SOBER...

&

RIDE FOR LIFE

WISCONSIN
DEPT. OF NATURAL RESOURCES

C

MINNESOTA DNR

September 7, 2001

SNOWMOBILE FATALITIES
2000-2001 SEASON

61.5% of fatal accidents involved alcohol
77.8% of the operator involved in fatal accidents involved alcohol
18.7% of operators in all accidents involved alcohol

Number of snowmobile fatalities	28
Number of injuries reported	519
Number of machines damaged	156
Total number of accidents reported	635

11/26/00, 9:43 a.m. - Kanabec County - Braham.
8 year old male operating a snowmobile was struck by a train. The operator was following a second snowmobile which had crossed the tracks and stopped. The operator of the first snowmobile attempted to stop the second snowmobile to keep it from being hit by the oncoming train. Snowmobile safety certificate - no. Alcohol involved - no.

12/14/00, 7:01 p.m. - Benton County - Langola Township.
40 year old male operating a snowmobile struck a tree. The operator was testing the snowmobile alone and did not return. The snowmobile was found in a farm field where it had struck a tree. The operator was dead at the scene. Snowmobile safety certificate - yes. Alcohol involved - **BAC - .05.**

12/20/00, 7:45 p.m. - Chisago County - Almelund.
32 year old male operating a snowmobile struck a tree. The snowmobile was traveling along the edge of a field when both the snowmobile and the operator struck a tree. The operator was wearing a helmet, but died from severe head injuries sustained from hitting the tree. Snowmobile safety certificate - no. Alcohol involved - **BAC -.12.**

12/28/00, 2:45 p.m. - Hennepin County - Rogers.
18 year old male operating a snowmobile was struck by a van. The snowmobile was traveling in the ditch along a county road. The snowmobile struck a snowbank and was propelled into the roadway, and struck by an oncoming van. Snowmobile safety certificate - no. Alcohol involved - no.

12/29/00, 8:04 p.m. - Dakota County - Castle Rock Township.
35 year old male passenger on a snowmobile was struck by another snowmobile. The snowmobile was traveling on a snowmobile trail in a group of snowmobiles. The passenger was thrown from the snowmobile when it hit a snow ridge. The passenger fell from the snowmobile and was struck by the following snowmobile. Snowmobile safety certificate - no. Alcohol involved - **BAC - .06.**

12/29/00. 8:09 p.m. - Mower County - Red Rock Township.
36 year old male operating a snowmobile was struck by another snowmobile. The snowmobile was traveling in the ditch along a roadway. The operator was thrown from the machine while avoiding a collision with a utility pole. The first operator was run over by another snowmobile in the group. The first operator died from trauma to the chest. Snowmobile safety certificate - no. Alcohol involved - first operator - **BAC - .027**; second operator - no.

12/30/00, 12:49 p.m. - Otter Tail County - Otto Township.
32 year old male operating a snowmobile was struck by a car. The snowmobile was traveling at a high rate of speed on a snowmobile trail. The snowmobile vaulted across the county road which intersected the trail, and was struck by a oncoming car. The snowmobile became airborne, the operator was dragged by the car, and then run over by the car as it went through the ditch. The operator was dead at the scene. Snowmobile safety certificate - unknown. Alcohol involved - no.

12/30/00, 8:20 p.m. - Pipestone County - Pipestone.
38 year old male operating a snowmobile was rear-ended by another snowmobile. The snowmobiles were traveling along a state highway. The first snowmobile stopped for a culvert, a second snowmobile was unable to stop and rear-ended the first snowmobile. The operator of the second snowmobile fell off the snowmobile and the snowmobile landed on the second operator's head. The second operator was wearing a helmet. The first operator was not injured. Snowmobile safety certificate - yes. Alcohol involved - first operator- **BAC - .09**; second operator - **BAC - .15.**

1/7/01, 4:00 p.m. - St. Louis County - Virginia.
37 year old male operating a snowmobile struck a tree. The snowmobile was traveling on the Laurentian Trail at a high rate of speed. The snowmobile hit a bump, the operator was thrown from the machine into a tree. The operator was dead at the scene. Snowmobile safety certificate - no. Alcohol involved - no.

1/20/01, 8:00 p.m. - Otter Tail County - border of Amor & Otter Tail Township.
23 year old male and a 25 year old male operating snowmobiles collided head on. The snowmobiles were traveling in a group on Otter Tail Lake and did not arrive at the appointed stop. The group searched for the missing snowmobilers, and reported them missing the next morning. A search found the snowmobilers at a crash site in the center of the lake. The first snowmobile had turned around, was traveling at a high rate of speed, braked for about 30 feet, and collided head on with the second snowmobile, also traveling at a high rate of speed. The first operator collided with the second operator, and both were dead at the scene. Snowmobile safety certificate - first operator - yes; second operator - no. Alcohol involved - first operator - **BAC -**

.13; second operator - **BAC - .13.**

1/27/01, 8:30 p.m. - Becker County - Waubun.
26 year old male operating a snowmobile collided with another snowmobile. The snowmobilers were originally in a group of twenty one traveling together. Three snowmobiles broke off from the group and were traveling east on Little Bemidji Lake at over 100 miles per hour. The first snowmobile in the eastbound group collided with a snowmobile traveling west, also in a group of three. A third snowmobile in the eastbound group, which was traveling slightly behind the first snowmobile, was unable to avoid the moving wreckage and collided with the wreckage. The first operator was thrown from his machine and was dead at the scene. The third operator was also thrown from his machine and was seriously injured. Snowmobile safety certificate - first operator - no; second operator - no. Alcohol involved - first operator - **BAC - .10**; second operator - **BAC - .15.** *Note: This and the following summary involve the same accident.

1/27/01, 8:30 p.m. - Becker County - Waubun.
25 year old male operating a snowmobile collided with another snowmobile. The snowmobilers were originally in a group of twenty one traveling together. Three snowmobiles broke off from the group and were traveling west on Little Bemidji Lake at a high rate of speed. The first two snowmobiles successfully avoided an oncoming eastbound group of snowmobiles. The last snowmobile in the westbound group collided head on with the lead snowmobile of the eastbound group of three. A third snowmobile, from the eastbound group traveling slightly behind the first snowmobile, was unable to avoid the moving wreckage and collided with the wreckage. The operator was thrown from his machine and was dead at the scene. Snowmobile safety certificate - no. Alcohol involved - **BAC - .01.**

2/4/01, 7:57 a.m. - Itasca County - Grand Rapids
25 year old male operating a snowmobile was thrown from the machine. The snowmobile was traveling on a roadway, missed a turn in the road, and the operator was thrown from the machine. The operator was dead at the scene. Snowmobile safety certificate - no . Alcohol involved - **BAC - .11.**

2/7/01, 11:35 a.m. - Cass County - Longville
38 year old male operating a snowmobile was thrown from the machine. The snowmobile was traveling on Woman Lake near Broadwater Bay in a group of four snowmobiles. The first snowmobile struck a plowed road embankment and the operator was thrown from his machine. The second snowmobile also struck the road embankment, the operator was thrown from the machine, and the snowmobile struck the first operator. Snowmobile safety certificate - no. Alcohol involved - no.

2/8/01, 4:00 p.m. - Renville - Franklin
15 year old male operating a snowmobile rolled over into a drainage ditch. The snowmobile was traveling on a Grant-In-Aid trail in the right of way of a road. The snowmobile had stopped, and then began moving again at a low rate of speed. The light, fluffy snow beneath the snowmobile gave way, the snowmobile slid into a drainage ditch, and rolled over onto the operator. The operator was dead at the scene. Snowmobile safety certificate - yes. Alcohol involved - no.

2/10/01, 2:53 a.m. - Crow Wing - Crosby.
15 year old male operating a snowmobile was thrown from his snowmobile. The snowmobile was traveling on a county road with another snowmobile. The first snowmobile stopped in the roadway and the second snowmobile rear ended the first. The operator of the second snowmobile was thrown from the machine and died from head injuries. The first operator and the passenger on the second snowmobile were also injured. Snowmobile safety certificate - first operator - no; second operator - yes. Alcohol involved - first operator - no; second operator - **BAC - .11.**

2/10/01, 4:00 p.m. - Marshall County - Strandquist.
43 year old male standing between two snowmobiles was struck by a snowmobile. A group of six snowmobiles were traveling on a Grant-In-Aid trail. The first three snowmobiles stopped on the side of the trail (township road), the third operator got off the snowmobile and stood between two snowmobiles. A fourth snowmobile failed to stop and struck the group, colliding with two machines and one operator. The operator of the first snowmobile was injured, and the operator of the third snowmobile died as a result of the injuries sustained in the collision. Snowmobile safety certificate - first operator - no; third operator - no; fourth operator - yes.. Alcohol involved - first operator - none taken; third operator - none taken; fourth operator - **BAC - .04.**

2/10/01, 5:52 p.m. - Yellow Medicine County - Hanley Falls.
44 year old male operating a snowmobile struck a drainage ditch. The snowmobile was fourth snowmobiler traveling in a group of nine in the ditch along Highway 23. The snowmobile went down into the drainage ditch and struck the opposite embankment. Snowmobile safety certificate - no. Alcohol involved - **BAC - .05.**

2/11/01, 5:30 p.m. - Washington County - Forest Lake.
15 year old male operating a snowmobile struck fence post. The snowmobile was traveling on Hardwood Creek Trail, hit a bump in the trail propelling the snowmobile into a fence post. Both the operator and the passenger were thrown from the machine. The operator was dead at the scene, the 13 year old passenger was injured. Snowmobile safety certificate - no. Alcohol involved - no.

2/13/01, 3:50 p.m. - Rice County - Faribault.
59 year old male operating a snowmobile collided with a truck. The snowmobile was traveling in the median of a state highway. The snowmobile failed to stop at the intersection of another state highway and collided with a truck. Snowmobile safety certificate - no. Alcohol involved - no.

2/22/01, 3:15 p.m. - St. Louis County - Floodwood.
63 year old male operating a snowmobile was thrown from the machine. The snowmobile was traveling on the Toivola-Floodwood trail at a high rate of speed and came to the crest of a hill. The operator was thrown from the machine, impacted the handlebars as he was ejected, and then continued another 119 feet down the trail. Snowmobile safety certificate - no. Alcohol involved - **BAC - .096.**

3/4/01, 1:43 a.m. - St. Louis County - Duluth.
50 year old male operating a snowmobile was thrown from the machine. The snowmobile was traveling on a Grant-In-Aid trail when the machine left the trail, glanced off one tree, continued into deep powder, and the operator was thrown into a tree. The operator was dead at the scene. Snowmobile safety certificate - no. Alcohol involved - **BAC - .171.**

3/11/01, 5:23 p.m. - LeSueur County - Cleveland.
15 year old male operating a snowmobile struck a car. The snowmobile failed to stop at a stop sign at a road crossing. The snowmobile was struck by oncoming car, the operator was ejected from the snowmobile upon impact, and thrown onto the hood of the car. The operator died at a later date due to injuries sustained in the accident. Snowmobile safety certificate -yes. Alcohol involved - no.

3/12/01, 12:30 a.m. - Wabasha County - Hammond.
33 year old male operating a snowmobile struck a high tensile wire fence. The snowmobile was traveling in a group on a Grant-In-Aid trail, the snowmobile left the trail, and struck a fence. The operator was dead at the scene, the passenger received minor injuries. Snowmobile safety certificate - no. Alcohol involved - **BAC - .23.**

3/12/01, 3:40 p.m. - Waseca County - Cleveland.
64 year old male operating a snowmobile struck a plowed road on Lake Elysian. The snowmobile was traveling with a group along the shoreline when it struck a ridge from a plowed road. The snowmobile and the operator rolled six times, and the snowmobile landed on the operator. The operator was dead at the scene. Snowmobile safety certificate - no. Alcohol involved - **BAC - .25.**

3/17/01, 01:14 a.m. - Wilkin County - Wolverton.
34 year old male operating a snowmobile struck a tree in dense fog. The snowmobile was traveling in the ditch of a county road in a group of three. The snowmobile left the ditch and went straight into a tree grove. The operator who was wearing a helmet, struck the tree with his head. Snowmobile safety certificate - yes. Alcohol involved - **BAC - .15.**

* 3/24/01, 10:00 a.m. - Aitkin County - Jacobson.
35 year old male operating a snowmobile drove into open water. The snowmobile was traveling on the Mississippi River and failed to cross a stretch of open water. The operator disappeared into the water and is presumed dead. The operator's body was recovered on 5/12/01. Snowmobile safety certificate - unknown. Alcohol involved - none taken.

cc: COL Bernhjelm
MAJ Spence
MAJ Letourneau
MAJ Schwartz
MAJ Everett
Dennis Asmussen

*Denotes water related fatality.

D

SNOW GLOW® INC HAZARD LIGHT SURVEY

Dear Fellow Snowmobilers,

By the request of a Snowmobile Manufacturer in 1997, Snow Glow®, Inc was asked to build a secondary lighting system. This system would be self- reliant and would show light when a snowmobile is parked or disabled in dark or low light scenarios. Thus, an Emergency Hazard Flasher System was developed and is available as an after market accessory. Just as with hazard lighting on an automobile, this system emits a pulsing yellow light to the front and red light to the rear that can be seen for well over a mile. The inconvenience with this system is however, that it is not particularly consumer friendly to install.

Installation could easily be done at the factory and at an equal or lesser cost to you the rider. Instead, some manufacturers are now saying there is no need for this system and you the snowmobilers are not interested in this type of safety and convenience system on your sled. They suggest reflectors are enough; reflective clothing is available and you have the option to carry a strobe light.

While these items do provide some measure of safety, a built-in hazard light system could be a life saver, whose time has come. Tell us what you think. To help ensure that snowmobiling is around for years to come - for you, your children, and your grandchildren to enjoy, please complete the brief questionnaire below.

The findings and results of this survey will be published in our continuing effort to keep you informed, and will be presented to all Snowmobile Manufacturers; the SSCC Snowmobile Safety and Certification Committee; ISMA International Snowmobile Manufacturers Association; SAE Society of Automotive Engineers; the Canadian Transport; and all other snowmobile affiliates, Insurance Companies, Law Enforcement agencies and other individuals who have assisted in this process.

Thank you in advance for your time and input. Remember, every single voice can make a difference.

---

1 **Please Complete the Survey,**

2 **Click the Submit Button &**

3 **Thank You for your Participation!**

Age & Sex [ ] (Click The Drop Arrow For Options)

How Many Years Riding? [ ] (Click The Drop Arrow For Options)

What % is Night Riding? [ ] (Click The Drop Arrow For Options)

First [ ]

Name

Last Name

Contact Email

Address Street:

City: State: ZIP:

Make and Model Snowmobile:

Have you ever attended a Snowmobile Safety Course? If yes, were you instructed on what to do when parked on a trail or lake at night? What were the instructions?:

When riding at night, have you ever been in a situation where stopped for mechanical failure, you felt uneasy or concerned about not being seen by oncoming traffic thus creating a potential collision?:

When riding at night, have you ever been in a situation where you purposely stopped on a lake or trail and felt uneasy or concerned about not being seen by oncoming traffic thus creating a potential collision?:

Do you use or carry supplemental lighting with you when you snowmobile? If yes, what?:

At night, do you ever purposely stop and park on the side of a trail and walk away from your machine to read a map, wait for others, rest & enjoy quiet time, etc. If so, how do you make your snowmobile visible in the event of oncoming traffic?:

Have you had experience or know of an experience when lost or broken down without any lights? What did you do?:

Do you personally have or know of anyone who has had the experience of being in any type of collision due to the fact that a snowmobile was stopped? If yes, would you share your story?:

Can you see the benefit and convenience of having a hazard light installed on your snowmobile?:

A snowmobile hazard flasher system has been called the most essential and invaluable safety feature yet introduced to the sport of snowmobiling. Others love the convenience and built-in security. Still, others say there is no need. What do you say? On a scale of 1 to 10 (with 10 being the highest) how important do you feel hazard flashers could be to the sport of snowmobiling? Please explain:

How did you hear about our survey? Any other comments you might want to add? We'd love to hear your input!:

Do you have any questions about Snow Glow®'s other products?:

Send Survey SUBMIT SURVEY **Thank You for Participating! Hope to SEE you on the trails!**

SEE THE ONGOING SURVEY RESULTS HERE!

RETURN TO SNOW GLOW® INC'S MAIN PAGE

The Association of Alcohol and Night Driving With Fatal Snowmobile Trauma: A Case-Control Study

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See related editorial, p 963.

Study objective: To investigate the association of alcohol use and night driving with traumatic snowmobile fatalities.

Design: Case-control study.

Participants: Traumatic deaths occurring while driving a snowmobile during the years 1985 to 1990 were reviewed. A sample of 1989 to 1990 fatal motor vehicle driver and motorcycle driver accidents were used as controls. Records were obtained from the provincial coroner.

Results: One hundred eight snowmobile fatalities, 432 motor vehicle fatalities, and 108 motorcycle fatalities were included. Young men (mean age, 30 years) made up the snowmobile fatalities population, with weekend fatalities predominating (67%). Snowmobile fatalities were associated with use during times of suboptimal lighting (crude odds ratio, 1.9 [95% confidence interval, 1.1-3.3]; $P<.01$). Blood alcohol concentration exceeded provincial limits in 64% of cases. When snowmobile fatalities were adjusted for occurrence during suboptimal lighting conditions, only alcohol use was associated independently with fatal outcome (adjusted odds ratio, 4.3 [95% confidence interval, 2.5-7.0]; $P<.0001$).

Conclusion: Drivers in snowmobile fatalities are associated with an approximately fourfold greater use of alcohol than are age- and sex-matched drivers in automobile and motorcycle fatalities. Preventive strategies should be targeted at reducing the use of alcohol while snowmobile driving in young men.

[Rowe B, Milner R, Johnson C, Bota G: The association of alcohol and night driving with fatal snowmobile trauma: A case-control study. *Ann Emerg Med* November 1994;24:842-848.]

INTRODUCTION

Snowmobiling is a popular winter activity in remote and rural areas of North America and Northern Europe. Despite their original use as transportation and work vehicles, most snowmobiles are used in recreational activities. Paralleling the growing popularity of this activity has been an increase in the number of injuries and deaths in areas popular with snowmobile enthusiasts.[1-14] Studies have outlined the importance of a number of factors associated with severe and fatal trauma, especially alcohol, excessive speed, and night travel.[1-14]

However, controversies surrounding the causes of snowmobile-related injury remain unresolved, mainly due to the inherent biases in trauma research.[15-17] These include referral bias to specialized trauma centers, case severity biases, and issues regarding methodology. In addition, most previous research was conducted many years ago, before the advent of today's high-speed snowmobiles. Finally, increased efforts to define the role of various risk factors have evolved as a result of the need to introduce prevention programs and curtail the rising incidence of traumatic injury and death from this activity.[1,2]

At present, comparisons of risk factors associated with fatal snowmobile trauma and other forms of vehicular fatalities do not exist. Although some studies mention fatalities,[1-3,5,7,13] only two publications specifically examined this issue.[1,7] Neither study included comparison or control populations. In addition, both studies included cases of passenger and pedestrian death, which cloud the issue of driver culpability, especially for issues such as alcohol use. Finally, comparative information is needed if preventive legislative initiatives are to gain momentum.

We conducted a comparative study examining factors associated with snowmobile fatalities in Ontario from 1985 to 1989. The preliminary work on this population has been published elsewhere.[1] Our case-control study compared snowmobile driver fatalities with motorcycle and motor vehicle driver fatalities. The primary objective was to examine the association of alcohol use and night driving in all snowmobile fatalities. The secondary objective was to compare demographic and fatal event data among the various groups.

MATERIALS AND METHODS

We used retrospective case control methodology to identify drivers dying as a result of snowmobile trauma in Ontario. The Coroner's Act mandates that all trauma-related and sudden, unexplained deaths in Ontario's eight regions be reported to the provincial chief coroner.[18] These deaths are registered using a code designating the type of vehicle and place of death; this system was developed by the Office of the Chief Coroner. A computerized list of all snowmobile-related deaths for the years 1985 to 1990 was generated. Complete capture of data was assumed as the coroner's office codes all snowmobile-related deaths, regardless of the cause.

Only accidental/traumatic fatalities occurring while the victim was driving a snowmobile were eligible for inclusion. Because passenger and pedestrian deaths would not be associated consistently with trauma, these cases were excluded. Also excluded were instances in which no obvious signs of trauma were identified or where death was the result of another cause. The following diagnoses were excluded: myocardial infarction, sudden cardiac death, hypothermia unrelated to drowning, cerebrovascular events, and suicide. Final decisions on study inclusion were made on the basis of the summary provided by the regional coroner involved in each case. Deaths from drowning while driving a snowmobile were included in this series.

A random-numbers table was used to select controls from a computer-generated list of all Ontario motor vehicle and motorcycle fatalities during 1989. Inclusion and exclusion criteria were similar for cases and controls. If the control was not a driver, the list was used to generate another control. The control also was matched to gender so that matching continued until four similar sex controls were selected from motor vehicle fatalities and one similar sex control was selected from motorcycle fatalities for each snowmobile fatality. All files were recovered and reviewed successfully after selection.

A data entry form was completed by a researcher unaware of the study hypothesis. Blood alcohol concentrations, urine alcohol concentrations, and/or "alcohol-implicated" histories (alcohol use prior to death as reported to police by friends or relatives in contact with victim) were abstracted from the pathology and police reports, as described elsewhere.[1] Other demographic and accident data also were collected. Extensive mechanical assessment of the vehicle was not completed for any of the fatal trauma cases; therefore, conclusions regarding the association of mechanical failure with fatal events were not possible.

Data were entered onto a Vax 8530 computer (Digital Inc, Boston, Massachusetts) using the Entrypoint-90 software program (Datalex, San Francisco, California). Analyses were completed using the SPSS-X software package. Proportions, means, and odds ratios (ORs) with 95% confidence intervals (CIs) are reported. Comparison of

continuous variables was made using paired two-sided *t* tests. Multiple statistical tests on the same data set inflated the overall α level; as a result, a Bonferroni correction was applied to the analysis. To determine if alcohol use and suboptimal lighting were associated independently with snowmobile fatalities, adjusted analyses using the Mantel-Haenszel χ^2 technique were performed.[16,19]

RESULTS

Computer records identified 149 snowmobile-related fatalities. There were 41 exclusions identified: 18 passenger deaths, 2 pedestrian deaths, 3 for whom driving status could not be determined with certainty, 14 infarctions myocardial or sudden cardiac deaths, 2 hypothermic deaths, 1 cerebrovascular accident, and 1 suicide. A total of 108 snowmobile drivers met the inclusion criteria for the study.

Four hundred thirty-two motor vehicle and 108 motorcycle driver deaths were matched to the snowmobile files on the basis of the criteria discussed. Table 1 shows demographic data comparing the groups. The table shows that snowmobiles involved in fatal trauma are driven predominantly by men; the control matching therefore dictated the gender makeup of the comparison groups. The youth of the victims of snowmobile and motorcycle fatalities in comparison to victims of motor vehicle accidents in comparison to victims of motor vehicle accidents also is illustrated.

The data revealed that fatalities occur most commonly in the northern regions for snowmobile drivers, in the southern regions for motorcycle drivers, and evenly throughout the province for motor vehicle drivers. In addition, tourism appears to play a role in snowmobile fatalities, as snowmobile fatalities were more common in tourists than in locals when compared to motorcycle drivers (OR, 2.72; 95% CI, 1.26-5.95). However, snowmobile fatalities and motor vehicle fatalities have similar contributions from tourists and locals (OR, 1.42; 95% CI, 0.85-2.37).

Table 2 shows data relating to the accident. Fatalities were more common on weekends for snowmobile drivers than for motor vehicle drivers (OR, 3.53; 95% CI, 2.21-5.65) and motorcycle drivers (OR, 2.51; 95% CI, 1.39-4.51). Drowning as a cause of death was more common for snowmobilers.

Table 2 also shows that the majority of snowmobile fatalities (81%) involved operating the vehicle during times of suboptimal lighting (between 4:00 PM and 8:00 AM). Snowmobile fatalities occurred more frequently at these times than did motor vehicle fatalities (OR, 2.09; 95% CI, 1.20-3.68) but not motorcycle fatalities (OR, 1.17; 95% CI, 0.56-2.43). Most patients were dead before arrival in

Table 1.
Demographic features of patients involved in fatal snowmobile, motorcycle, and motor vehicle trauma in Ontario.

Feature	Snowmobile	Motorcycle	Motor Vehicle
Age (mean yr)	29.9	24.0	39.7*
Gender (% men)	99	99	99
Location (%)			
Northeast	37 (34)‡	8 (7)	48 (11)
South Georgian	26 (24)	15 (14)	58 (13)
Central	19 (17)	17 (16)	83 (19)
Northwest	13 (12)	1 (1)	23 (5)
Southeastern	9 (8)	15 (14)	77 (18)
Niagara	2 (2)	15 (14)	52 (12)
Southwest	2 (2)	20 (18)	61 (14)
Toronto	—	17 (16)	30 (7)
Residence (%)			
Local	78 (72)	95 (88)†	340 (79)
Nonlocal	29 (27)	11 (10)	89 (21)
Others Injured (%)	18 (17)	29 (27)	209 (48)
Others Dead (%)	23 (21)	5 (5)	82 (19)

*Significant difference between snowmobile and motor vehicle statistics.
†Significant difference between motorcycle and snowmobile statistics.
‡Totals do not equal 100% because of missing information.

Table 2.
Trauma event features of patients involved in fatal snowmobile, motorcycle, and motor vehicle trauma in Ontario.

Feature	Snowmobile (%)	Motorcycle (%)	Motor Vehicle (%)
Time of Accident			
8:01 AM to 4:00 PM	20 (19)	22 (21)	135 (33)‡
4:01 PM to midnight	46 (44)	53 (52)	148 (36)
12:01 AM to 8:00 AM	39 (37)	27 (27)	126 (31)
Day			
Weekend	72 (67)	48 (44)§	156 (36)‡
Weekday	36 (32)	59 (56)	275 (64)
No. Drowning	35 (32)	0	0
Death			
DOA/DIE*	93 (87)	88 (81)	352 (80)
DIH < 48 hr†	12 (11)	15 (14)	45 (10)
DIH > 48 hr†	2 (1)	5 (5)	34 (8)

*DOA, *dead on arrival or at scene*; DIE, death in the ED after failure of resuscitative efforts.
†DIH: death in hospital; numbers may not add up to total fatalities due to missing information.
‡Significant difference between snowmobile and motor vehicle statistics.
§Significant difference between motorcycle and snowmobile statistics.

the emergency department. Single-vehicle accidents predominated.

Table 3 summarizes the alcohol intake of the study groups. For the period immediately prior to the fatal event, alcohol was implicated by police report or blood sample in 81 snowmobile drivers (75%). Detectable levels of blood alcohol were identified in 79 people (73%); alcohol levels exceeding what is considered safe for the operation of a motorized vehicle in the Province of Ontario were recorded in 71 (65%).

The figures for blood alcohol exceeding provincial limits were lower in both motor vehicle fatalities (137, 31%) and motorcycle fatalities (38, 35%). In other words, drivers killed on snowmobiles were more likely to be seriously intoxicated than those driving motor vehicles (OR, 4.13; 95% CI, 2.59-6.62) and motorcycles (OR, 3.52; 95% CI, 1.95-6.45); combined control groups are presented in Table 4 (A).

In addition, this association persisted when adjustment was made for time of day (Table 4 [B]). The mean blood alcohol contents for cases with positive blood alcohol results were high (snowmobile fatalities, 34.4 mmol/L; motor vehicle fatalities, 38.4 mmol/L; motorcycle fatalities, 32.2 mmol/L); no difference was seen between snowmobile fatalities and motorcycle fatalities or motor vehicle fatalities' mean blood alcohol contents. No differences were detected between mean alcohol levels and the time of trauma (P=.96).

The results of the unadjusted analyses indicate darkness-related driving (defined as driving after 4:00 PM and before 8:00 AM the next day) to be associated with snowmobile fatalities when compared to motor vehicle controls (Table 4 [C]). However, this association disappears when adjustments are made for blood alcohol content using Mantel-Haenszel techniques (Table 4 [D]). Moreover, these findings are consistent regardless of the control group used (motorcycle fatality, motor vehicle fatality, or the combined motorcycle fatalities/motor vehicle fatalities group).

Table 3.
Alcohol intake features of patients involved in fatal snowmobile, motorcycle, and motor vehicle trauma in Ontario.

Feature	Snowmobile	Motorcycle	Motor Vehicle
Alcohol implicated (%)	81 (75)	43 (40)†	169 (39)*
Alcohol detected (%)	79 (73)	42 (39)†	164 (38)*
Alcohol level > 17 mmol/L (%)	71 (65)	38 (35)†	138 (31)*
Alcohol level (mmol/L)	34.4	32.2	38.4
Range (mmol/L)	3-77	6-64	3-91

*Significant difference between snowmobile and motor vehicle statistics.
†Significant difference between motorcycle and snowmobile statistics.

Table 4.
Unadjusted and adjusted (Mantel-Haenszel test) analyses examining the association of snowmobile driver fatalities with alcohol use (A and B, respectively) and night driving (C and D, respectively).[5]

A	Blood Alcohol Content (mmol/L)	Cases (Snowmobile Fatalities)	Controls *
	≥17	71	172
	<17	37	352

Crude OR, 3.9 (95% CI, 2.6-6.2); P<.0001.

B	Blood Alcohol Content (mmol/L)	Cases (Snowmobile Fatalities)	Controls *
Night †			
	≥17	65	141
	<17	20	192
Day ‡			
	≥17	6	17
	<17	14	140

Mantel-Haenszel χ^2=35.64; df=1; P<.0001; adjusted OR, 4.3 (95% CI, 2.5-7.0).

C	Type of Driving	Cases (snowmobile fatalities)	Controls *
	Night †	85	354
	Day ‡	20	157

Crude OR, 1.9 (95% CI, 1.1-3.3); P<.01.

D	Blood Alcohol Content (mmol/L)	Cases (Snowmobile Fatalities)	Controls *
≥17			
	Night †	65	141
	Day ‡	6	17
<17			
	Night †	20	192
	Day ‡	14	140

Mantel-Haenszel χ^2=.07; df=1; P=.79; adjusted OR, 1.13 (95% CI, 0.61-2.09).

*Motorcycle and motor vehicle fatalities combined.
†Night, 4:00 PM to 8:00 AM.
‡Day, 8:00 AM to 4:00 PM.
§Numbers do not add to total cases and controls because of missing information regarding death times or alcohol levels.

DISCUSSION

Accepted criteria to evaluate causation in research exist;[15,16] however, their application has not gained widespread acceptance in the field of trauma epidemiology. The application of these criteria to alcohol use and night driving are shown in Table 5. The criteria are developed from several sources.[15-17,20] Although the final decision on any factors or agents is often complicated and subject to debate, these criteria can provide a framework for such evaluation. The controversy and debate surrounding causation are perhaps most clearly illustrated when more sophisticated methodology (ie, randomized, controlled trials) cannot be applied to the research question and when multiple factors are implicated.[21] Such a situation exists when one considers risk factor assessment in traumatic/accidental events.

In the past, snowmobile studies were simply a series of cases from a particular area where the traumatic events are common.[1-14] Information for these studies is considered the weakest form of evidence for causation.[15,16] Higher-quality studies include case-control studies; cohort studies; and randomized, controlled trials, in order of increasing strength of evidence. Comparison populations (case-control study) had not been used in snowmobile studies prior to our study, and higher-quality evidence (cohorts, randomized; controlled trials) also was not present in the literature. Observational cohorts often are impractical, and randomized, controlled trials in this setting are not feasible and could be considered unethical.

Table 5.
Evaluation of the evidence for alcohol use and night driving in snowmobile trauma, using nine diagnostic tests for causation.[15]

Causative Criteria	Alcohol Use	Night Driving
Strength of evidence	Case-control (weak)	Case-series (weakest)
Strength of association	Yes	No
Crude ORs	3.9*	1.9*
Adjusted ORs	4.3*	1.1*
Consistency from study to study	Moderate	Moderate
Temporality	Yes	Yes
Dose-response gradient	Yes	†
Epidemiologic sense	Yes	Yes
Biologic sense	Yes	Yes
Specific	No	No
Previously known association	Yes	‡

*Statistically significant.
†Insufficient evidence.
‡Equivocal evidence.

While the use of controls generally increases the strength of the inferences drawn from a study, researchers must take care to select controls that are both sensible and unbiased. We chose to use both motor vehicle and motorcycle controls in this study to increase the generalizability of the results. The availability of motor vehicle fatality statistics allowed for a 4:1 match; however, the motorcycle fatality controls were less frequent and resulted in a 1:1 match. Finally, the controls were matched for driver status and gender to reduce the bias contributed by the fact that male fatalities predominate in snowmobile trauma.[1-14] Because men engage more frequently in risk-taking behaviors (such as alcohol use) while driving, failure to match for gender would have resulted in a bias in favor of excessive alcohol use in the snowmobile cases. In addition, matching of cases and controls on the basis of driver status assured the completeness of records and elimination of information on passengers or bystanders that may not have contributed to the actual fatal event.

Because police accident reports were used for both cases and controls, accident time and alcohol data are considered accurate. Although snowmobile trauma and fatalities often occur in remote, rural, and northern areas, they are witnessed frequently. The resultant accident typology information can be considered as valid as that for motor vehicle and motorcycle fatalities.

Analysis of risk factors in fatal events must be approached in a multifactorial fashion. There are a number of injury models to study how events occur, and there is currently no uniformity among them.[22,23] In motor vehicle fatalities, it is convenient to categorize factors contributing to the cause of death into those related to the vehicle, the environment, and the operator.[22,23]

Attempts have been made to examine each of these areas;[1,2] however, the most complete information is provided for the operator and environment. In our study, we concentrated on environmental issues (night driving) and those factors under the influence of the operator (alcohol consumption), as it has been suggested previously that these should lie at the heart of prevention strategies for snowmobile trauma.[1,2]

The association of alcohol with snowmobile fatalities in our study is consistent with findings from the only other study to examine snowmobile fatalities.[7] Regardless of the method of measurement, alcohol was detected in significantly more snowmobile fatalities than motorcycle or motor vehicle fatalities and exceeded the legal limit in nearly two-thirds of all snowmobile cases. This may result because drivers of snowmobiles do not consider that the risks of alcohol use and driving apply to the use of these

"off-road" vehicles. Alternatively, the chance of being detected by law enforcement officials is small in many remote and rural settings, therefore removing a known deterrent.

Drivers of all motorized vehicles in this study had extremely high blood alcohol levels, with motor vehicle drivers having slightly higher blood alcohol levels than motorcycle or snowmobile drivers. The current attitude surrounding the use of alcohol and operation of snowmobiles can be compared to that of an earlier era when the combination of drinking and driving was more prevalent. Campaigns to deter drivers from drinking in other settings have successfully reduced the number of alcohol-related fatalities.[2,4] Alcohol use in recreational activities such as snowmobiling requires similar, intensive approaches to reduce injury and death.

The environment can provide challenges to all operators of motor vehicles, particularly snowmobiles. The comparison vehicles in this study usually operate on supervised and well-constructed roads, whereas snowmobiles travel over unpredictable, snow-covered terrain. This factor alone may be responsible for a large number of the deaths in snowmobiling.

Previous studies have suggested that serious and fatal injuries are more common during periods of suboptimal lighting, that is, from 4:00 PM to 8:00 AM.[1,2,7,8] While our unadjusted data supported these claims when compared to motor vehicle serious injuries and fatalities, they provided evidence for a similar pattern in motorcycle serious injuries and fatalities. The fact that 82% of all fatalities occur during these hours illustrates the danger of driving at night (Table 3). Although deaths are indeed more common during times of suboptimal lighting, this association appears attributable to a greater frequency of excessive alcohol use during the evening and night. Thus, adjustment of these data for confounding features indicates that alcohol use is strongly and independently associated with snowmobile fatalities. While this may be so, other data suggest that night driving may continue to be a risk for those who are injured but not killed.[2]

CONCLUSION

Snowmobiling has become a popular recreational activity in many remote, rural, and northern areas. Subsequently, snowmobile-related trauma has become an important health care problem in areas where this activity is common.

In this study, we found that many factors associated with fatal events appear preventable. First, young men represent the group at greatest risk of death from traumatic injuries while snowmobiling. Our results strongly support previous claims that the operator contributes significantly to his or her own death.[1,7] Moreover, the excessive use of alcohol is closely associated with snowmobile fatalities. This factor is controlled directly by the operator.

Interventions designed to reduce the number of people suffering all forms of snowmobile-related injury are needed. Snowmobile drivers must be educated further about the strong association of snowmobile fatalities with alcohol use. In addition, increased surveillance in areas of frequent snowmobile use may help change the perception that snowmobilers are immune to criminal prosecution. Finally, using the data from this study, a combined effort of safety interventions should be targeted at young, healthy men, the principal users of motorcycle and snowmobiles.

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MORBIDITY AND MORTALITY WEEKLY REPORT

Injuries Associated With Use of Snowmobiles — New Hampshire, 1989–1992

Recreational use of snowmobiles is popular in New Hampshire during the winter months; from 1982 to 1992, the annual number of registered snowmobiles ranged from approximately 21,200 to 42,500. During this period, 26 deaths associated with use of snowmobiles in New Hampshire accounted for 822 years of potential life lost before age 65 years. To assist in the development and evaluation of injury-prevention programs for users of off-highway recreational vehicles (OHRVs) (e.g., all-terrain vehicles, trail bikes, and snowmobiles), the State of New Hampshire Department of Fish and Game (DFG) and the New Hampshire Department of Health and Human Services examined reports of injuries resulting from OHRV use in New Hampshire from January 1989 through February 1992*. This report summarizes information about snowmobile-associated fatal and nonfatal injuries during this period.

Since 1981, New Hampshire has required reporting of OHRV incidents resulting in injury. A standard report form must be completed by a person involved in the event or by a law enforcement agent and filed with DFG within 5 days of the incident. Information collected on the form includes demographic characteristics of the operator, type of vehicle, environmental conditions, date and time of the incident, whether the operator reported having taken an OHRV safety course, type of injury, excessive speed, and use of alcohol and helmets.

During January 1989–February 1992, DFG received reports of 164 snowmobile incidents resulting in injury. Of the 164 incidents, 155 involved 188 vehicles and resulted in 163 nonfatal injuries, and nine involved 13 vehicles and resulted in 12 fatalities and two nonfatal injuries (Table 1). All fatal incidents were reported by law enforcement agents. Of the 155 reports of nonfatal incidents, 103 (66%) were completed by a law enforcement agent.

All operators involved in fatal (13) and most involved in nonfatal (161 [86%]) incidents were male. Seven (54%) operators involved in fatal incidents and 75 (40%) operators involved in nonfatal incidents were aged 20–29 years; no operators involved in fatal incidents and 40 (21%) involved in nonfatal incidents were aged <20 years. No operator involved in a fatal incident and 14 (7%) of those involved in a nonfatal incident were reported to have taken an OHRV safety course.

*Because the standard reporting form was changed in 1992, comparison with later years was not possible.

Snowmobiles — Continued

Of nine fatal events and 155 nonfatal events, seven (78%) and 64 (46%), respectively, occurred during darker periods (i.e., 4 p.m.–8 a.m., November–March). No fatal and 25 (16%) nonfatal events occurred during periods of precipitation or other inclement weather (i.e., fog or active snow, sleet, or rain). Operating on a frozen body of water was reported for five of nine fatal and 36 (23%) of 155 nonfatal events.

Overall, 67% of fatal incidents were associated with alcohol use and 67% with excessive speed. Of the 103 police-reported nonfatal incidents, 16 (16%) involved alcohol use, and 36 (35%) involved excessive speed; in comparison, of 52 incidents reported only by persons involved in the incident, one (2%) and three (6%), respectively, reported use of alcohol or excessive speed.

Of eight deaths resulting from incidents occurring on a frozen body of water, three resulted from hypothermia and five from either head and neck injuries (three) or multiple trauma (two). Three other deaths were attributed to head and neck trauma and one to multiple trauma.

Of 165 persons nonfatally injured, 104 (63%) were reported to have been wearing helmets. Helmets were reported to have been worn by 31 (57%) of 54 persons with nonfatal head injuries, compared with four of six persons with fatal head injuries.

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Editorial Note: In New Hampshire, most fatal snowmobile incidents involved male operators in their 20s, use of alcohol, or excessive speed; half of persons killed sustained head injuries. In addition, fatalities occurring as a result of operating on frozen bodies of water were associated with either severe trauma or events related to

TABLE 1. Selected characteristics of incidents and operators* of snowmobiles involved in injury, by outcome — New Hampshire, January 1989–February 1992

	Operator involved in fatal incident (n=13)		Operator involved in nonfatal incident (n=188)	
Characteristic	**No.**	**%**	**No.**	**%**
Male	13	(100)	161	(86)
Age <20 years	0		40	(21)
Age 20–29 years	7	(54)	75	(40)
Safety course completion	0		14	(7)
	Fatal incident (n=9)		**Nonfatal incident (n=155)**	
Condition	**No.**	**%**	**No.**	**%**
Darker periods†	7	(78)	64	(46)
Operating on a frozen body of water	5	(56)	36	(23)
Inclement weather§	0		25	(16)
Excessive speed¶	6	(67)	36	(35)
Alcohol use¶	6	(67)	16	(16)

*One incident may involve more than one vehicle or operator.
†Defined as 4 p.m.–8 a.m., November–March. Denominator is 139 for nonfatal category (no time noted on other reports).
§Fog or active snow, sleet, or rain.
¶For police-reported incidents only: 100% of fatal reports; 103 (66%) nonfatal reports.

Snowmobiles — Continued

falling through the ice (i.e., hypothermia). These findings are consistent with previous studies of fatalities associated with the use of OHRVs (*1,2*). For example, contributing factors for nondrowning deaths following incidents on frozen water surfaces have included high speeds attained on such open surfaces and unexpected uneven terrain (e.g., ice ridges) (*1*). The findings in this report also indicate that some snowmobile drivers and passengers did not wear helmets. Although this investigation could not assess the effectiveness of helmet use, a previous study estimated that helmet use can reduce the risk for death among all-terrain vehicle operators by approximately 42% and can reduce the likelihood of head injury in a nonfatal incident by approximately 64% (*3*).

The findings in New Hampshire are subject to at least three limitations. First, rates of injury and death could not be determined because of the lack of an accurate denominator. Although previous studies have used registered OHRVs as a denominator, this number may vary in relation to season and other environmental factors (e.g., inclement weather). Second, because approximately one third of nonfatal injury reports were completed only by persons involved in the incident, some information reported may not be valid (e.g., helmet use, speed, and alcohol use). Finally, these findings probably underestimate the true incidence of snowmobile-associated injuries because of underreporting. Review of hospital emergency and discharge records could assist in evaluating the extent of underreporting.

Information from the injury reporting system in New Hampshire may be useful for public health surveillance and assessment of snowmobile and other OHRV injuries (*4*). In addition, this data source can be used by the New Hampshire Snowmobile Association and other organizations to target high-risk groups for intervention programs. Since 1975, DFG has operated a safety training course for OHRV users. State law requires that any OHRV operator driving off their private property either possess a valid driver's license (minimum age: 16 years) or have taken this course. Operators aged <30 years should especially be targeted by any intervention strategy; in particular, young operators with a valid driver's license are encouraged to take the DFG safety course.

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